2nd Edition

Warehouse Workers Safety Guide

Prepared by the Canadian Centre for Occupational Health and Safety

CCOHS

Emergency Information

Ambulance

Fire

Police

Poison Control Centre

Doctor

Company Emergency Phone Number

Prepared by

Canadian Centre for Occupational Health and Safety
Hamilton, Ontario, Canada

© CCOHS, 2004

105-04388/

Warehouse Workers Safety Guide

2nd Edition

Published 2004

P99-5E
ISBN 0-660-17984-9
DSS Catalogue Number CC273-2/99-8E

Canada $10.00 (+GST)
US/Other $10.00 (USD)
(Prices subject to change without notice)

© CCOHS, 2004

Personal Information

This handbook belongs to:

Name _____

Company _____

Position _____

Address _____

Phone _____

Doctor _____

Phone _____

Allergies _____

Medical Conditions _____

_____

_____

_____

In case of emergency please notify:

Name _____

Relation _____

Address _____

_____

Phone _____

Warehouse Workers Safety Guide

Performance Objectives

This is your guide to working safely in a warehouse. It will help you to:

- recognize workplace hazards
- prevent accident and injury
- follow safe work practises
- select and use proper personal protective equipment (PPE)
- understand your duties and rights as given in the occupational health and safety legislation
- contact government departments to find health and safety related information

Target Audience

This guide is for anyone who works in warehouses, storage facilities, bulk stores and the transport industry. It is a handy companion for workers, supervisors, managers, occupational health nurses and health and safety committee members.

Summary

Warehouse work involves a wide range of tasks and hence a wide range of health and safety hazards. Here are some of the injuries and illnesses that can occur:

- cuts and amputations from the use of knives, cutters, saws, packaging tools and materials
- burns from contact with live electrical conductors or hot equipment engines
- crushing injuries from material handling equipment and processes
- electric shock or electrocution from power tools, defective switch panels, accidental contact with electric power lines, or cleaning of equipment that hasn't been turned off
- slips and falls from slippery or cluttered floors or inadequate lighting
- soreness and loss of function of wrists and arms due to repeated awkward movements or vibration, or working in one position for a long time
- back pain from lifting heavy or awkward loads and using awkward postures
- itching, swelling, redness of skin from temperature extremes, physical abrasion, exposure to detergents or cleaning solutions
- allergies and skin disorders from contact with metals and contaminated packages, inhalation of dusts and plant materials
- illness due to exposure to chemicals and pesticides, or contact with packages contaminated with biological infectious materials such as animal droppings
- carbon monoxide poisoning from internal combustion engine emissions due to poor vehicle maintenance and inadequate ventilation
- battery charging hazards from electric powered forklifts and other battery powered equipment

This guide presents ways of working safely to prevent injuries and illnesses in a warehouse.

Table of Contents

Section I **Basic Rules of Safety**

1. The Law Says 2
2. Elements of On-the-Job Safety 2
3. Safety Tips for New Employees 3
4. Safety Tips for Supervisors 4

Section II **Maintaining High Standards of Safety**

1. Accident Investigation and Reporting 6
   - *Purpose* 6
   - *Investigation Team* 6
   - *Roles and Responsibilities* 6
   - *Report* 6
2. Safety Inspections 7
   - *Purpose* 7
   - *Inspection Team* 7
   - *Role and Responsibility* 7
   - *Inspection Reports* 7
3. Sample Inspection Checklist 8
   - *Sample Inspection Report* 9
4. Hazard Reporting 10
5. First Aid 11

Section III **Common Hazards and Safety Tips**

1. Ergonomics 14
   - *Job Demands* 14
   - *Workplace Components* 14
   - *Symptoms* 14
   - *Suggested Work Practices to Prevent RMI* 15
   - *Computer Workstations* 18
   - *Using the Telephone while Operating a VDT* 18
   - *Feet* 19
   - *Sitting* 20
2. Housekeeping 20
3. Indoor Air Quality 21
   - *Symptoms of Poor Indoor Air Quality* 21
   - *Recognizing and Controlling Indoor Air Problems* 21
4. Confined Space 22
   - *Definition* 22
   - *Health Hazards* 23
   - *Entering a Confined Space* 23
   - *Safe Work Procedures* 23
5. Lockout Procedures 24

Purpose 24
Established Procedures 24
Compliance 25

Section IV Emergency Preparedness

1. Emergency Guidelines 28
2. Hazardous Material Spills 28
Initial Response Information 28
3. Spill Procedures 29
4. Fire Control 29
Fire Extinguishers 29
5. Eyewash Stations and Emergency Showers 31

Section V Warehouse and Terminals

1. Warehouse 34
Floors 34
Ramps 34
Aisles 35
Storage Platforms 36
Ladders 36
2. Terminals 43
Loading Docks 43
Vehicles 44
Trailers 45
Dockplates 46

Section VI Manual Materials Handling

1. General Safety Tips on Lifting and Moving 50
Manual Lifting 52
Transferring Weight 53
Carrying 54
Pushing and Pulling 55
2. Specific Methods for Specific Container Type 56
Bags 56
Bales 56
Barrels 57
Boxes and Cartons 57
Crates 57
Cylinders (gases) 58
Drums 58
Carboys 59
Storage 60
Pallets 60
Plate Glass 60
Sheet Metal 61
Long Objects 61
Rolls 61
Flat Circular Items 62

Section VII Materials Handling

1. Shipping and Packing 64
Sealers and Glue 64
Strapping 65
Shrink Wrap, Bag Sealers and Plastic Strapping Welders 66
Packing 67
2. Materials Handling Equipment 68
Carts 68
Conveyors 72
Hoists 75
Jacks 76
Rollers and Dollies 77
Tools 78

Section VIII Powered Vehicles for Moving and Lifting

1. Personal and General Safety 86
Loads 87
Trailer Loading 87
Batteries 87
Fuel 89
2. Motorized Vehicles 90
General Safety Tips 90
Electric Hand Trucks (Walkies) 92
Forklifts 93
Stock Picking Lifts 95
Side Loading and Straddle Trucks 96
Tow Motors and Tractors 97
Automated Guided or Electronically Controlled Vehicles 98
Crane Trucks and Boom Trucks 100
Rigging 101

Section IX Material Storage

1. General Safety Tips 104
2. Storage Units 104
Bins, Silos and Hoppers 104
Pallets and Skids 105
Shelves and Bays 105
Racks 106
Rigid Containers 106
Tanks 107
Transfer Pipes and Ducts 108
3. Hazardous Materials 109
Flammable and Combustible Solids and Powders 109
Flammable and Combustible Liquids 110

Compressed Gas Cylinders 111
Chemicals 111

Section X The Work Environment

1. Vibration 114
2. Noise 114
3. Dust 115
4. Lighting 116
5. Working in Hot Environments 117
Health and Safety Legislation and ACGIH Guidelines 117
Humidex 117
Potential Health Problems 118
Preventing Heat Related Illness 118
6. Working in Cold Environments 119
Effect of Wind 120
Equipment Design 120
Exposure Control 120
Protective Clothing 120
7. Ultraviolet (UV) Radiation 121
UV Index 121

Section XI Occupational Health and Safety (OH&S) Legislation

1. OH&S Legislation 124
Government's Responsibilities 124
Worker's Rights and Responsibilities 124
Employer's Responsibilities 124
Joint Health and Safety Committee 125
Role of Joint Health and Safety Committee 125
Work Refusals 125
2. Workplace Hazardous Materials Information System (WHMIS) 126
WHMIS Symbols and Classes 127
3. US Occupational Health and Safety Legislation 128
4. Fire Code 130
5. Building Code 131
6. Transportation of Dangerous Goods Act 131
7. Emergency Spill Reporting and Assistance 135

Section XII Information Sources

1. Canadian Government Departments 138
2. US Federal Safety and Health Agencies 143
3. State Occupational Safety and Health Plans 147

Section I

Basic Rules of Safety

1. The Law Says...
2. Elements of On-the-Job Safety
3. Safety Tips for New Employees
4. Safety Tips for Supervisors

1. The Law Says...

Health and safety laws are meant to protect you.

By law your employer must provide you with a safe and healthy workplace.

It is your employer's responsibility to make sure that you understand the safe way of doing your work.

Working safely is your responsibility. You must use personal protective equipment required by your employer, follow safety procedures required in your area and report any hazardous conditions you are aware of.

If you think a task is too dangerous, you have the right to refuse to do that job until it can be done safely. You must report to your supervisor your intention to refuse dangerous work.

2. Elements of On-the-Job Safety

1. **The right way is the safe way** of doing your job. Follow instructions. If you don't know, ask.
2. **Know potential hazards** in your work and ways of working safely to prevent such hazards.
3. **Know safety rules for specific jobs** and be able to explain these rules to fellow workers.
4. **Follow emergency procedures** in case of fires, medical emergencies, and need of rescue squad.
5. **Report all injuries** including minor scratches, cuts, burns, slips and falls. Your employer needs to know, in order to take corrective action to prevent future injuries. Follow your company's procedures for reporting injuries.
6. **Know emergency equipment** such as fire extinguishers, eyewash and safety showers and understand how to use this equipment.

7. **Use personal protective equipment** as required by your employer. Such equipment includes, but is not limited to, safety glasses, hearing protectors, respirators, safety boots, hard hats, gloves and face shields.

8. **Learn special safety procedures** for particularly hazardous work such as vessel entry, confined space entry, electrical work and welding.

9. **Follow electrical safety rules** when using electrical equipment, grounding portable electrical tools and working near overhead power lines.

10. **Know how to protect yourself** from the elements when working outdoors in very cold weather or in direct sunshine (UV rays).

11. **Perform a circle check** *(see page 89)* before taking out a vehicle.

12. **Lock out and tag energy sources** (electrical, mechanical, hydraulic, pneumatic, chemical, etc.) of all machinery and equipment under repair.

13. **Report unsafe** practises and unsafe conditions.

14. **Wear clothing that's appropriate** to the tasks you perform. Do not wear loose sleeves, cuffs, rings, bracelets, nor anything else that may get caught in moving machinery and cause injury.

Off-the-job safety is equally important. Safety should not stop when you leave your workplace.

3. Safety Tips for New Employees

When you are starting a new job, ask your supervisor or employer the following health and safety related questions.

- What are the potential hazards of the job?
- Is job safety training available?
- What safety equipment do I need to do my job?
- Do I need to wear personal protective equipment (PPE)?

- Will I receive training on how to use the PPE?
- What do I do in case of fire or another emergency?
- Where do I find fire extinguishers, first aid kits, first aid rooms and emergency assistance?
- What are my responsibilities regarding health and safety?
- In case I notice something wrong, to whom should I report?
- Who is responsible for answering safety related questions?
- What do I do if I get injured, or have an accident?

4. Safety Tips for Supervisors

- Explain the importance of safety to employees.
- Implement safe work practises.
- Give praise for safe behaviour.
- Solicit participation.
- Reward for participation.
- Set an example.
- Promote safety by providing books, videos, literature, etc.
- Visit plant areas regularly.
- Know employees personally.
- Improve and simplify safety continuously.

Section II

Maintaining High Standards of Safety

1. **Accident Investigation and Reporting**
   - Purpose
   - Investigation Team
   - Roles and Responsibilities
   - Report
2. **Safety Inspections**
   - Purpose
   - Inspection Team
   - Role and Responsibility
   - Inspection Reports
3. **Sample Inspection Checklist**
   - Sample Inspection report
4. **Hazard Reporting**
5. **First Aid**

1. Accident Investigation and Reporting

Purpose

The purpose of accident investigation is to find out root cause of the accident and to prevent reoccurrence. Accidents, incidents and near misses (close calls) must be investigated.

Investigation Team

The accident investigation team generally consists of the following:

- manager or supervisor
- company safety officer (if available)
- health and safety committee representative(s)
- injured employee (if available)
- reporting employee

Roles and Responsibilities

You must report any occurrence of an accident or incident to your manager or supervisor immediately.

Your manager/supervisor is responsible for conducting the accident investigation and notifying the health and safety committee and other people as required by your company.

Report

The accident investigation report is generally submitted as a formal document which includes the following:

- name and occupation of employee
- location and time of accident
- names of witnesses
- description of the incident including equipment and working conditions

- recommendations about implementing corrective measures
- name of the person completing the report
- recommendations for remedial action

2. Safety Inspections

Purpose

The purpose of an inspection or safety tour is to identify unsafe conditions as well as unsafe practises, and to recommend remedial action. The occupational health and safety legislation requires regular workplace inspections (in Canada).

Inspection Team

Inspection teams should consist of a mix of personnel such as hourly workers, full-time employees and managers.

When conducting an inspection, it is important that team members use required personal protection and set a good example. The inspection team should talk to the workers.

Role and Responsibility

Inspections are undertaken in accordance with a schedule agreed upon by the health and safety committee. The inspection teams generally use a checklist as a guide for conducting inspections. You may use the checklist *on page 8* as a guide to develop one for your own workplace.

Inspection Reports

Inspection reports are communicated to all levels of the organization. Inspection reports should be posted on bulletin boards, reviewed at health and safety committee meetings, and distributed to the management for review and response.

3. Sample Inspection Checklist

Date: _____ Location/Department: _____

Yes = Satisfactory **No = Unsatisfactory, needs attention**

Yes	No	Safe Practices
☐	☐	Use of machine guards
☐	☐	Considering the safety of co-workers
☐	☐	Proper lifting
☐	☐	Smoking only in designated areas
☐	☐	Proper use of tools
☐	☐	Following company rules
☐	☐	Lockout procedures
☐	☐	Material storage
☐	☐	Other
		Personal Protective Equipment
☐	☐	Safety glasses
☐	☐	Safety shoes
☐	☐	Gloves
☐	☐	Masks
☐	☐	Protective clothing
☐	☐	Respirators
☐	☐	Other
		Housekeeping
☐	☐	Floors (dry, clean, uncluttered)
☐	☐	Storage (uncluttered)
☐	☐	Proper storage of flammable materials (oils, greases, rags etc.)
☐	☐	Disposal of waste
☐	☐	Grounds and traffic areas
☐	☐	Other
		Tools
☐	☐	Work area
☐	☐	Power tools
☐	☐	Hand tools
☐	☐	Use and storage
☐	☐	Other
		Machinery
☐	☐	Forklifts
☐	☐	Carts
☐	☐	Conveyors
☐	☐	Snow blowers
☐	☐	Point of operation guards
☐	☐	Belts, pulleys, gears, shafts
☐	☐	Oiling, cleaning, adjusting
☐	☐	Maintenance, oil leakage
☐	☐	Other
		Fire Protection
☐	☐	Fire extinguishing equipment
☐	☐	Type
☐	☐	Location
☐	☐	Maintenance
☐	☐	Storage of flammable material
☐	☐	Emergency exits, lighting
☐	☐	Sprinkler systems
☐	☐	Other
		First Aid
☐	☐	First aid kits, first aid area
☐	☐	Stretchers, emergency blankets
☐	☐	Trained first aid providers
☐	☐	Emergency numbers
☐	☐	All injuries reported
☐	☐	Other
		Miscellaneous
☐	☐	MSDS / Labels
☐	☐	New processes
☐	☐	Control: chemicals, solvents, dusts, vapours, fumes
☐	☐	Ladders
☐	☐	Other
		Vehicles
☐	☐	Good condition
☐	☐	Signals, lights
☐	☐	Operating procedures
		Building Facility
☐	☐	Stairs, guardrails
☐	☐	Illumination
☐	☐	Ventilation
☐	☐	Emergency alarms
☐	☐	Bulletin boards
☐	☐	Toilets, sinks, showers
☐	☐	Drinking water
☐	☐	Lockers
☐	☐	Eyewash fountains
☐	☐	Emergency showers

Sample Inspection Report

Area Inspected _____ Inspector _____ Date _____

Priority Code (See below)	Location	Hazards	Recommended Corrective Action(s) Person(s) Responsible	Follow-Up Date	Date Completed

Analysis and Comments

Priority Code: **A** – do immediately **B** – do within 3 days **C** – do within 2 weeks **D** – other

4. Hazard Reporting

The health and safety legislation requires employees to report hazards to their supervisor. The immediate hazard reporting process allows employees to report hazardous conditions or practices as they notice them. This allows for prompt corrective action without waiting for the next round of regular inspections.

Hazards can be reported verbally or by filling a simple form. The following is an example of such a form.

Sample Hazard Reporting

Name of employee _____ Date _____

Location _____

Equipment _____

Description of the hazard _____

_____

_____

_____

Suggested corrective action _____

_____

Signature _____

Supervisor's remarks _____

_____

Corrective action taken _____

_____

_____ _____

Signature of Supervisor Date

5. First Aid

First aid regulations require that employers in all workplaces provide first aid facilities, equipment, and trained personnel. For details please check first aid regulations applicable to your workplace.

People who hold valid first aid certificates should make sure that the contents of first aid boxes are maintained and periodically replenished.

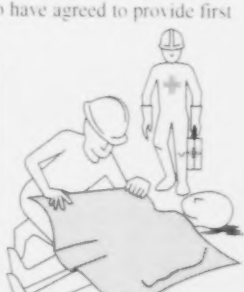
For information regarding first aid boxes and first aid training please contact the local branch of the St. John Ambulance Association or the Red Cross Society.

In case of injury:

1. Promptly obtain first aid.
2. Notify your supervisor/employer.
3. Ask for a treatment memorandum to take to a doctor or hospital. If there has been contact with a chemical, take along the material safety data sheet (MSDS).
4. Complete and promptly return all forms received from the Workers' Compensation Board.
5. Your employer should decide on the need for an accident investigation.

Your employer should post the names and telephone numbers of the people who have agreed to provide first aid at the workplace.

DO NOT MOVE an injured person



WAIT for a qualified person to administer first aid

Section III

Common Hazards and Safety Tips

1. Ergonomics

- Job Demands
- Workplace Components
- Symptoms
- Suggested Work Practises to Prevent RMI
- Computer Workstations
- Using the Telephone while Operating a VDT
- Feet
- Sitting

2. Housekeeping

3. Indoor Air Quality

- Symptoms of Poor Indoor Air Quality
- Recognizing and Controlling Indoor Air Problems

4. Confined Space

- Definition
- Health Hazards
- Entering a Confined Space
- Safe Work Procedures

5. Lockout Procedures

- Purpose
- Established Procedures

1. Ergonomics

Repetitive Motion Injuries (RMI) are painful injuries of the muscles and joints. These are also known as work-related musculoskeletal disorders (WRMDS) and repetitive strain injuries (RSI).

The causes of RMI are:

Job Demands

Posture: Awkward postures or prolonged standing or sitting in a fixed position.

Force: Use of excessive force which overloads muscles and tendons, such as pushing, pulling or lifting heavy objects.

Repetition: Use of the same muscles and joints over and over again while doing a repetitive task, such as operating computer keyboard, or data entry work.

Workplace Components

Manual Materials Handling: lifting, loading, carrying

Workstation Design: bending, overreaching

Equipment and Tools: vibration, grip force

Environment: heat, noise, lighting

Work Organization: too much to do, too many types of jobs to do, poor equipment design.

Symptoms

Symptoms of Repetitive Motion Injuries (RMI) are pain, numbness or tingling in the wrist, hand, shoulder or neck; and clumsiness or loss of grip in fingers.

The onset of RMI is gradual and progressive.

Causes	Symptoms
Repetitive manual tasks	Pain in the hands and wrists
Awkward postures	Pain in the neck, back and legs
Improper lifting and transferring of loads	Back pain, back injury
Carrying heavy loads, frequently reaching above shoulder level	Pain, weakness and numbness in the shoulders, arms and fingers
Inadequate lighting	Eye strain, headache, pain in the back and neck due to awkward position while performing visual tasks

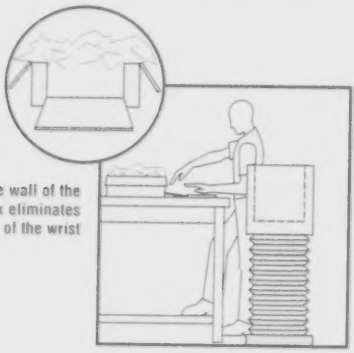
Suggested Work Practices to Prevent RMI

Posture

- Work should be organized in such a way that your body is in an unstrained, comfortable position with your arms and forearms relaxed.
- Shape tools to maintain a comfortable straight wrist position and a comfortable grip.

Repetitive Work

- Position hands and wrists comfortably.
- Use two hands instead of one.
- Reduce repetition as much as possible by pacing your work at a comfortable rate, and by varying tasks.
- Use ergonomically designed tools.
- Maintain tools in good working condition to avoid the need for excessive force.
- Wear gloves and use tool handles with good grip.



Cutting one wall of the box eliminates bending of the wrist

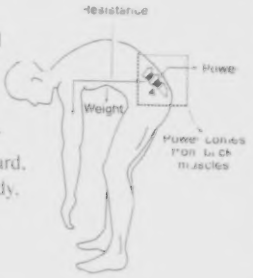
- Hand, wrist and upper body exercises can help prevent problems. Ask your doctor or therapist.
- Perform different tasks during the day to avoid undue stress and repetition of any one kind.

Reaching

- Don't overstretch yourself. Reach only as high as is comfortable.
- Use a stool or ladder to reach high objects.
- When reaching down, support your body with one arm.

Bending

- To bend safely, kneel down on one knee.
- Bend your hips and knees, not your back.
- When reaching forward, move your whole body, not just your arms.

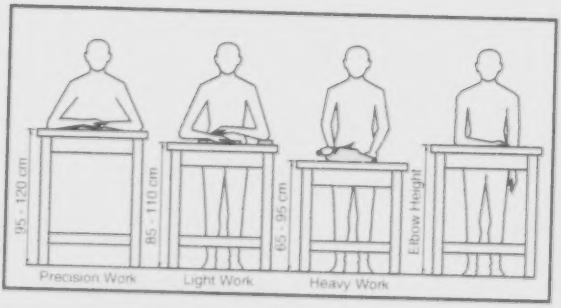


Standing

Work Surfaces:

- The desirable working height for standing is 5 to 10 cm below elbow level: between 95 and 100 cm for most men and 88 to 93 cm for most women.
- Tools and materials should ideally be located about 10 to 15 cm below elbow height.
- For heavy work the working surface needs to be lower – about 15 to 40 cm below elbow height.

Table Heights for Standing



See the section on Manual Materials Handling for detailed information on how to prevent musculoskeletal injuries.

Computer Workstations

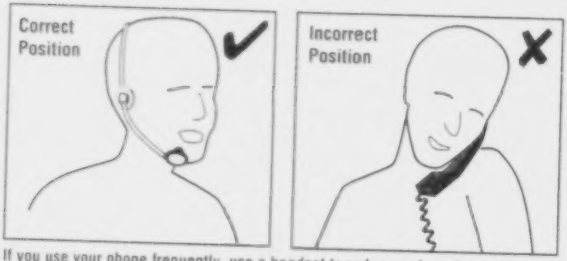
Chin in line with the centre of the screen
Wrist in a neutral position (no bending)
Keyboard directly in front of you
Mouse close to the keyboard and at the same level
Shoulder and hip in line
Back rest fits inward curve of spine
Armrest at elbow height
Knees slightly lower than hip
Feet flat on floor or footrest
Seat pan height–just below knee cap

Using the Telephone while Operating a VDT

PLACE the telephone close to you on your right side if you are right-handed. It reduces repetitive reaching.

TALKING on the phone while typing or writing notes forces you to cradle the receiver between your shoulder and chin. This results in tension in the shoulder and neck causing discomfort and risk of musculoskeletal injury.

REPLACE the conventional telephone with one equipped with a head set. In noisy areas consider the use of biaural headsets.



If you use your phone frequently, use a headset to reduce awkward neck postures

Feet

☑ AVOID standing for long periods on concrete or metal floors. Wooden, cork or rubber-covered surfaces are more comfortable to stand on.

CHOOSE footwear according to the hazard at your workplace. Safety footwear, if required, must be approved and carry the proper ratings for the hazard.

Your feet can only be as comfortable as the footwear permits.

ENSURE footwear has adequate arch supports.

WEAR footwear that allows freedom to move your toes. Shoes that are too narrow or too shallow cause pain and fatigue.

USE a shock absorbing, cushioned insole when working on metal or cement floors.

USE padding under the tongue if you suffer from tenderness over the bones at the top of the foot.

CHOOSE safety shoes that provide a firm grip for the heel. If the back of the shoe is too wide or too soft the foot will slip, causing instability and soreness.

☒ DO NOT wear flat shoes.

DO NOT wear shoes with heels higher than 5 cm (2 inches.)

Sitting

Pressure on the lower thighs can cause circulation problems and excessive fatigue. This may occur if a chair is too low or too high.

USE a foot support if your feet do not reach the floor.

2. Housekeeping

A clean, properly maintained and organized work environment is an important part of preventing accidents and injuries.

☑ ENSURE routine and periodic maintenance and housekeeping.

USE enough of the correct types of containers for waste.

USE adequate storage space for work materials.

SUPPRESS DUST by wet sweeping or vacuuming dusty areas.

KEEP all floors, aisles and ramps free of potholes, tripping hazards, dust and debris.

KEEP all stairs, gangways and platforms clear and railings intact.

KEEP all entrances, exits and doors unobstructed.

KEEP window ledges, overhead pipes and rafters clear of dust and debris.

KEEP fire fighting equipment, first aid boxes and other emergency equipment clean, operational and unobstructed.

ENSURE lighting is adequate and fixtures are clean.

KEEP equipment clean and properly serviced.

KEEP vents and exhausts unobstructed.

KEEP washrooms and lockers clean and sanitary.

DO NOT use emergency equipment such as fire extinguishers as door stops.

DO NOT prop open fire doors.

DO NOT use flammable cleaners without adequate ventilation.

3. Indoor Air Quality

Indoor Air Quality (IAQ) refers to the total indoor environment including:

- air contaminants entering the building through the ventilation system
- airborne biological agents such as mold, fungi, and substances from plants
- emissions from furniture, glues, sealants paints and varnishes
- toxic gases, vapours, fumes, etc. from laboratories, photocopiers and other processes and activities taking place inside the building
- indoor environment factors such as temperature, humidity, noise, lighting and air movement

Symptoms of Poor Indoor Air Quality

The occupants of buildings with poor Indoor Air Quality experience headache, fatigue, dry throat, shortness of breath, skin irritation, dizziness, itchy eyes, bleeding nose and/or general malaise.

Recognizing and Controlling Indoor Air Problems

The best way to determine whether or not there is an indoor air problem is to ask people. A wide variety of questionnaires are available for conducting employee response surveys.

The first step of controlling indoor air quality is to monitor the ventilation system's effectiveness. This involves measuring the carbon dioxide (C02) level in the air. Where the level of C02 is low, indoor air quality is better

because air contaminants are diluted. Indoor CO2 concentrations below 1000 ppm (parts per million) are generally accepted as a good indicator of ventilation effectiveness. The concentration of CO_2 in outdoor air is about 350 ppm.

The ASHRAE 62-1989 standard of the American Society of Heating, Refrigerating and Air-Conditioning Engineers is the most widely used standard for ventilation and indoor air quality.

4. Confined Space

Definition

In the Canadian federal legislation, "confined space" is defined as an enclosed or partially enclosed space that:

a) is not designed or intended for human occupancy except for the purpose of performing work;

b) has restricted means of access and egress; and

c) may become hazardous to any person entering it owing to:

i) its design, construction, location or atmospheres,

ii) the materials or substance in it, or

iii) any other conditions relating to it.

[Canada Labour \ Code Part 11 and Regulations]

Legal definitions of confined space may vary slightly from one jurisdiction to another.

Check your occupational health and safety (OH&S) legislation for the definition of confined space applicable to your workplace.

Health Hazards

Low levels of oxygen or high levels of hazardous gases, fumes, toxic vapours or dusts may be present in these situations:

- asphyxiation due to lack of oxygen.
- suffocation or entrapment due to shifting materials
- flammable or explosive conditions
- the psychological distress of being in a confined space

These conditions can lead to serious injury, or death. Inquire about any potential hazards of the work you're about to perform.

Entering a Confined Space

☑ ENTER a confined space only when:

- safe passage into and from the confined space is assured
- all power sources have been disconnected and locked out
- equipment has been locked out or blocked out (check all three areas: process, electrical and mechanical)
- all pipes and supply lines have been blanked off, drained, flushed, purged and tagged
- the atmosphere has been tested and evaluated
- all sources of heat or sparks have been eliminated
- the space is adequately ventilated

Safe Work Procedures

Your employer must develop and implement procedures for working safely in confined spaces. A confined space entry program must cover the following:

☑ FAMILIARIZE yourself with your company's written procedures for working in a confined space.

KNOW the rescue procedures for removing a person from a confined space.

☒ DO NOT enter a confined space which cannot be purged and ventilated, without using suitable breathing apparatus and a safety line with a harness.

5. Lockout Procedures

When equipment is stopped for maintenance or repair, accidents can happen if the power source is still activated or can accidentally be activated, setting the machine into motion. Accidental start-up of machines is a major cause of serious injuries, including amputations, and fatalities. "Lockout" is the process of safeguarding against this.

Purpose

The purpose of lockout is to protect an employee working in a confined space, on a machine, or on moving equipment.

Established Procedures

Your employer must have an established safe working procedure which includes the following instructions:

☑ MAKE SURE that you possess an individually numbered lock and key if you are required to work on moving equipment or enter a confined space, vessel or machine.

SHUT OFF the machine or equipment, then disengage all sources of power and lock them in the OFF position.

BLOCK or otherwise immobilize mobile equipment and devices that are likely to fall.

RELEASE the buildup of air, hydraulic, steam or gas pressure and ground electric charge buildup before starting work.

LOCK valves and switches. Some employers may require that the supervisor attach his/her lock too.

RELEASE any tension or pressure, such as springs on a mechanism, where possible.

NOTIFY users that work is being done on the machine or equipment.

INSTALL your personal lock on the control devices or on the "Lockout Board" provided.

CHECK by pushing the start button or switch to ensure that the correct switch has been disconnected.

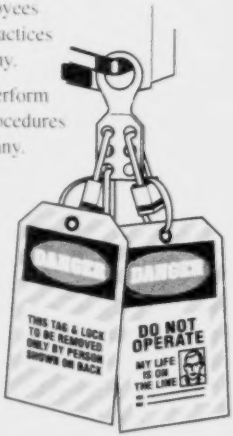
ENSURE that neither the lock nor the signs can be easily removed. FOLLOW procedures in compliance with legislated safety requirements.

DO NOT have another person remove your padlock or block signs.

DO NOT restart a machine unless all safeguards are in place.

Compliance

1. During lockout all employees must comply with the practices establishd by the company.
2. Authorized employees perform lockout following the procedures established by the company.



Section IV

Emergency Preparedness

1. **Emergency Guidelines**
2. **Hazardous Material Spills**
   Initial Response Information
3. **Spill Procedures**
4. **Fire Control**
   Fire Extinguishers
5. **Eyewash Stations and Emergency Showers**

1. Emergency Guidelines

The Canadian standard Z131M91, published by the Canadian Standards Association, provides guidelines for emergency planning.

US workplaces follow OSHA standard 1910.120 Hazardous Waste Operation and Emergency Response (HAZWOPER).

For workplaces within the USA, consult "Emergency Management Guide for Business and Industry" published by the Federal Emergency Management Agency (FEMA).

Emergency Assistance can generally be obtained from your local Fire Department or Police Department.

Your employer is required to develop, implement and communicate to each employee an emergency plan which outlines the following:

- duties and responsibilities of each individual in case of emergency
- a step-by-step procedure on how to obtain assistance
- detailed procedures for evacuating the building

2. Hazardous Material Spills

A spill can occur when a container is broken or tripped on or develops a leak. Small spills or spills of diluted concentrations can generally be cleaned up by everyday housekeeping methods. Follow company procedures.

ALL LARGE SPILLS OR SPILLS OF HAZARDOUS MATERIALS REQUIRE SPECIAL ASSISTANCE.

Reportable spill quantities are specified in environmental legislation.

Initial Response Information

Your employer is required to implement an emergency response plan for hazardous material spills. Practise drills should be conducted regularly to ensure that the plan is functional.

Material Safety Data Sheets (MSDS) and package labels provide information on procedures for spill control, required personal protection and neutralizing of chemicals.

3. Spill Procedures

☑ FOLLOW written procedures developed by your company for dealing with spills.

USE personal protective equipment required by your employer. Specific recommendations can be found on labels or MSDSs.

INFORM the person responsible for evacuation and emergency response.

WARN people in adjacent areas. Spilled material will leak or spread to connected areas through holes or drains.

CONTAIN spills by preventing spilled materials from spreading through drains or any other openings.

ISOLATE the area from the rest of the building. Close doors and keep them closed or establish other forms of barrier.

LEAVE the area if gases and/or vapours are present. Do not return without proper breathing apparatus.

4. Fire Control

Four elements – heat, oxygen, fuel and chain reaction – must be present to cause a fire. If any one of these four elements is removed, the fire will go out.

Fire Extinguishers

Portable fire extinguishers can put out only small fires. You should be trained in order to be able to use a fire extinguisher.

☑ SELECT and locate fire extinguishers according to:

- type of potential fire hazard
- degree of hazard
- area to be protected

Class of Fire	Type of Fire	Approved Fire Extinguisher
	Wood, paper, cloth	Type A; Type A-B
	Gasoline, paints, oils, grease	Type A-B; Type B-C; Type A-B-C
	Electrical wiring, fuse box	Type B-C; Type A-B-C

FOLLOW fire safety procedures established by your employer.

GET training in the use of fire extinguishers. Contact the fire extinguisher manufacturer or your local fire department to arrange fire-extinguisher training.

In small storage areas and warehouses, fire extinguishers should be located between 9 and 15 metres of all locations depending on the size and type of extinguisher. Contact your local fire department.

Fire extinguishers must be located:

- along aisles that provide access to an EXIT
- in areas that minimize travel distance
- in accordance with fire regulations and National Fire Protection Association Standards

FOLLOW recommendation of fire code applicable to your workplace.

KEEP extinguishers fully charged and in their designated places.

REPLACE used extinguishers while they're being recharged.

INSPECT extinguishers at least monthly to ensure that:

- they are in their designated places
- they have not been tampered with
- they are full (check the weight)
- their gauges indicate they are fully charged
- they are not corroded or otherwise damaged
- the maintenance record tags are up-to-date

ENSURE extinguishers are serviced at least yearly.

ATTACH a tag to show the maintenance or recharge date and signature or initials of the person who performed the service.

ENSURE that extinguishers are tested according to manufacturer's recommendations.

5. Eyewash Stations and Emergency Showers

Eyewash stations and emergency showers should be available where people work with hazardous chemicals. US ANSI Z358.1-1998 standard is generally used as a guideline for this purpose.

LEARN how to use eyewash stations.

ENSURE that an eyewash station and shower are located within 10 seconds travelling time and less than 30 metres from any hazardous work area.

ENSURE that the normal routes to the stations are unobstructed and easy to access, even for someone who cannot see.

ENSURE that the water supply is adequate and the units are tested weekly.

ENSURE the location is away from electrical equipment and outlets.

INDICATE clearly, consistently and graphically the locations of eyewash stations and emergency showers.

ENSURE that portable units have enough water for extended washing and that they are cleaned and refilled weekly on a regular basis.

KEEP bowl clean.

☒ DO NOT use portable eyewashes unless adequate water supplies are unavailable.

DO NOT block the actuator (push handle).

Operating Procedures: EYEWASH STATIONS

☑ ACTIVATE unit.

LOWER head so that both eyes are flushed.

FLUSH EYES with water or fluid for at least fifteen minutes.

CALL for assistance.

Operating Procedures: EMERGENCY SHOWERS

REMOVE hat or head gear.

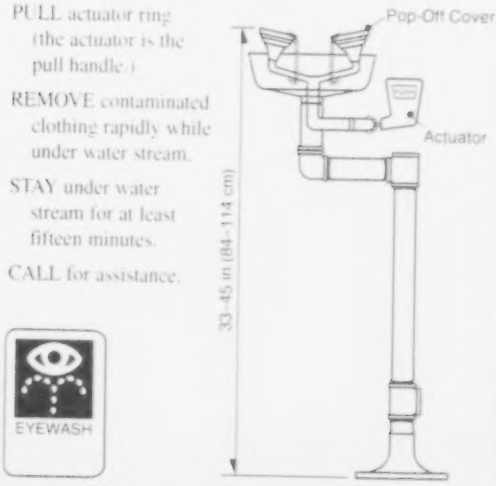
STAND under shower head immediately.

PULL actuator ring (the actuator is the pull handle.)

REMOVE contaminated clothing rapidly while under water stream.

STAY under water stream for at least fifteen minutes.

CALL for assistance.



Section V

Warehouse and Terminals

1. Warehouse

- Floors
- Ramps
- Aisles
- Storage Platforms
- Ladders

2. Terminals

- Loading Docks
- Vehicles
- Trailers
- Dockplates

1. Warehouse

Floors

Risks

slips, falls
being hit by falling objects

A warehouse floor must be:

- constructed of durable materials
- flat and level to prevent materials or moving vehicles from toppling
- strong enough not to collapse if items fall
- prepared with a nonslip surface

CHECK floor load capacities and surface durability before new procedures or equipment are introduced.

PROVIDE ample space for the work and loads planned.

KEEP floors free from obstructions, debris, lubricants and moisture.

DO NOT USE thick foam-rubber mats. Too much cushioning can cause fatigue and increase the risk of tripping.

Ramps

Risks

slips, falls
being hit by rolling carts and trolleys

Ramps should have:

- handrails and curbs or toeboards
- walls or guardrails at lease 92 cm (36 inches) high on open sided ramps
- nonskid surfaces:
  abrasive in centre with hand carts
  abrasive in tracks with power equipment

- cleats on steep ramps
- the lowest practical grade, less than one in ten (10 percent) for normal work and not exceeding 2.5 in 10 (25 percent.)

Aisles

Aisles should provide the shortest practical distance between work areas.

Risks

slips, trips, falls
collisions

Potential Hazards

Doors that open into aisles.
Structural supports in or immediately adjacent to aisles.

Aisles should:

- be marked with traffic paint or edging material:
  one way – 1 metre wider than the widest vehicle
  bidirectional – 1 metre (39 inches) wider than twice the width of the widest vehicle
- allow enough room for vehicles to back and turn around in
- have adequate lighting and visibility
- allow enough corner space for vehicles to turn
- have mirrors to avoid blind corners and intersections

DO NOT put machines, storage or waste containers in aisles.

Storage Platforms

Risks

slips, trips, falls, collisions

ENSURE the structure is strong enough to support at least four times the planned load.

KEEP access areas and aisles clear.

PROVIDE railings and kickboards or screened enclosures.

REPLACE removable sections of railings immediately after access.

DO NOT overload.

DO NOT store loose materials or liquids in raised areas above work areas.

Ladders

Choosing a Ladder

SELECT CSA (standard Z11-M81) approved ladders only. Check your health and safety legislation for compliance requirements.

CHOOSE only ladders which suit the requirements of the job and meet safety standards.

CHOOSE ladders constructed of material that is resistant to any gases, vapours, fumes or chemical substances in the work environment.

USE ladders made of non-conducting material (such as wood) for electrical work.

SELECT Type I (industrial) or Type-II (commercial) as determined by the working load or weight the ladder will hold.

ENSURE ladders are of an adequate height or extension for the task being performed.

Inspecting a Ladder

Inspect ladders before each use for:

RAILS that are missing, cracked, twisted, distorted, split, worn, or have loose or broken braces or sharp edges

STEPS or RUNGS that are loose (if they can be moved by hand) or have sharp edges

NAILS, SCREWS, BOLTS, HINGES or other metal parts that are loose or broken

SURFACES that are rough or splintered

NO-SLIP FEET that are damaged or worn

IDENTIFICATION LABEL MISSING

TREADS that show rust, oxidization and excessive wear

LOCKS that do not latch properly when ladder is extended

CRUMBLING MASONRY and broken or corroded mounts on fixed ladders

TAG defective ladders and take out of service

DO NOT make temporary or makeshift repairs.

DO NOT try to straighten or use bent or bowed ladders.

Setting Up Portable Ladders

Falls from portable ladders are a major source of serious injury. Be aware of possible hazards and take proper precautions to prevent falling.

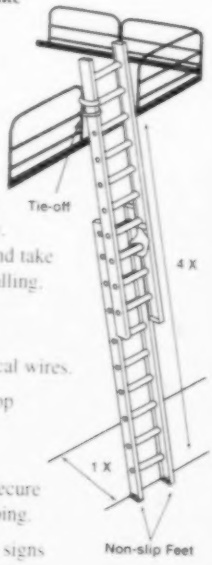
GET help when handling a heavy or long ladder.

KEEP ladder away from electrical wires.

CLEAR area around base and top of ladder of debris, tools and other objects.

TIE OFF ladder at the top and secure bottom to prevent it from slipping.

SET UP barricades and warning signs when using ladder in a doorway or passageway.



PLACE ladder feet 1/4 of ladder's working length away from the base of the structure.

EXTEND ladder at least 1 m (3 ft) above the landing platform.

PLACE ladder on a firm footing using nonslip feet or secure blocking, or have someone hold the ladder.

REST both side rails on top support, and secure ladder to prevent slipping.

Stepladder

X DO NOT use ladder in a horizontal position as a scaffold plank or runway.

DO NOT use any item such as a chair, barrel or box, as a substitute for a ladder.

DO NOT splice together short ladders to make a longer ladder. Side rails are not strong enough to support the extra load.

Platform Stepladder

DO NOT use ladder in passageways, doorways, driveways or other locations where a person or vehicle can hit it. Erect suitable barricades or lock doors shut.

DO NOT place ladder against flexible or moveable surfaces.

DO NOT straddle the space between the ladder and another object.

Working on Portable Ladders

CHECK for overhead electrical wires before setting up ladder.

TIE yourself off with a safety harness when working 3 m (10 ft) or more off the ground or when working with both hands.

CLEAN slippery boot soles before mounting ladder. Avoid climbing with wet soles. Ensure that footwear is in good condition.

FACE the ladder when going up or down and when working from it.

KEEP the centre of your body within the side rails.

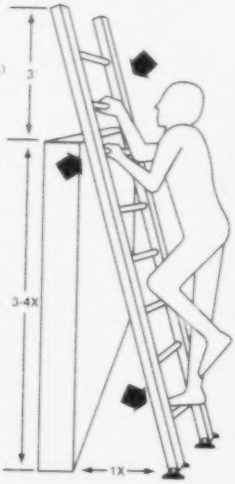
ENSURE that only one person is on a single-width ladder. Only one person is allowed on each side of a double-width ladder.

MAINTAIN three point contact by keeping two hands and one foot, or two feet and one hand, on ladder at all times.

GRASP rungs, not side rails, when climbing a ladder. If your foot slips, it's easier to hold onto rungs than to side rails.

WEAR protective footwear with slip-resistant soles and heels.

ENSURE that all electrical equipment used for ladder work is in good condition and properly grounded.



DO NOT carry objects in your hands while on a ladder. Hoist materials or attach tools to your belt.

DO NOT work from the top rungs. The higher you are on the ladder, the greater your chance of it toppling over.

DO NOT overreach from ladder. Step down and move ladder as required.

DO NOT use ladder near electrical wires.

Working with Fixed Ladders

MAINTAIN three point contact by keeping two hands and one foot, or two feet and one hand, on ladder at all times.

WEAR footwear with heels and nonslip soles.

CHECK both the ladder and your feet for slippery materials such as mud, grease, oil, and ice.

FACE the ladder and use both hands to grip the rungs or side rails firmly.

ENSURE feet are placed firmly on each rung or the ground before transferring your full body weight.

INSTALL free-fall safety devices if they are available.

DO NOT carry tools or materials by hand while climbing.

DO NOT race up or down a ladder.

DO NOT slide down a ladder.

DO NOT jump from a ladder.

Working with Shelf Ladders and Stockroom Ladders

Shelf ladders are designed to lean against solid shelves.
Stockroom ladders are free-standing and often have casters.

ENSURE the weight of items being carried or placed on the ladder never exceeds the load limit of the ladder or casters.

ENSURE shelf ladders are secured against solid parts of the shelf unit.

USE these ladders for reaching and carrying small stock items from shelves.

WEAR footwear with nonslip soles.

ENSURE your feet and the ladder are free of slippery materials such as grease, oil, and water.

FACE the ladder.

HAVE one hand free to hold the ladder when carrying items.

ENSURE casters are locked or retracted before climbing the ladder.

DO NOT overreach from ladder. Step down and move the ladder as required.

DO NOT carry heavy items which can throw off your balance.

Shelf Ladder

Working with Trolley Ladders and Side Rolling Ladders

Trolley and side rolling ladders are types of shelf ladders supported at the top by rollers in a track. They may have wheels at the bottom.

ENSURE the wheels and track are lubricated and in good condition.

CHECK the wheels and track to ensure the wheels can't jump out of the track even if a wheel breaks.

ENSURE the upper wheelbase is at least 20 cm.

Stockroom Ladder

ENSURE the load placed on the ladder does not exceed the weight the trolley is designed to support.

ENSURE bottom casters are locked or retracted before climbing the ladder.

Working with Mobile Tubular Ladders and Platforms

Tubular ladders are mobile staircases leading to a raised platform. They are of solid construction. They range in size from one or two steps for reaching low shelves, as in an office, or full staircases for larger stores or warehouses.

Smaller units generally have casters which retract when a load is on the ladder. Larger units have fixed casters which can be locked when the unit is in use.

Mobile Ladder

☑ ENSURE units over four steps have handrails.

ENSURE the unit and casters will support the loads they are intended for.

PLACE the unit as close to the work area as possible so that long reaches are not necessary.

WARN people when moving the unit.

☒ DO NOT use lightweight, "household" work platform ladders.

DO NOT use the unit without ensuring the casters are retracted or locked.

DO NOT attempt to lift heavy or bulky items over the handrails. These ladders and platforms are generally light and can easily tip.

DO NOT carry large loads that may block your path of travel.

2. Terminals

Loading Docks

Loading docks are high risk areas.

Risks

- slips, falls, cuts
- being crushed between a truck and a loading dock
- being caught between two vehicles
- being hit by falling materials or equipment
- being caught by conveyors
- being hit by material moving equipment

☑ KEEP loading docks clean and free of obstructions, debris and stored items.

CLEAN all spills immediately. Oils and grease are particularly hazardous. Cover all grease and oil spills with absorbant immediately, then clean up.

KEEP the area free of snow and ice. Salt or sand slippery areas immediately.

MAKE SURE that there are no unauthorized persons in the loading and unloading areas

STAY CLEAR of equipment handling heavy or long loads.

INDICATE traffic areas with painted lines.

PAINT LINES near the edges of the dock to minimize the risk of people stepping or driving off.

USE corner mirrors or curved ceiling mirrors in areas where there is poor visibility, such as corners, angles or curves in the traffic path, and doorways.

CHOCK all material and equipment which could roll, to prevent rolling.

SECURE all tools and equipment which could fall.

KEEP enough distance from nearby vehicles to be seen by the drivers.

ENSURE that the truck bed can withstand the weight of the load and the material handling equipment

Loading docks should have:

SHELTER when possible. Dock shelters protect the loading dock, dockplates and trailers from wind, rain, and snow.

DOCK LEVELLERS and fixed-position hydraulic dock boards on high use docks which receive a variety of trucks or rail cars.

ADEQUATE ILLUMINATION. A minimum recommended is 20 foot candles. More illumination may be required to read small labels, waybills or other materials.

EMERGENCY SHOWERS AND EYEWASHES if chemicals are being handled.

DO NOT use the loading dock as a storage area.

DO NOT walk directly in front of a loading dock without ensuring the area is clear of vehicles.

DO NOT stand directly behind a backing vehicle. If you are directing the driver, always stand to the side.

Vehicles

Risks

- being caught under a vehicle
- amputations
- being caught between vehicle and dock boards

MAKE SURE that no one is able to start the engine unless loading and unloading is completed.

USE wheel chocks ahead of rear wheels to prevent rolling. This is particularly important when moving heavy materials or using powered material handling equipment.

ENSURE powered forklifts don't accidentally push against a vehicle moving it away from the dock.

INSPECT all vehicles including a full circle check *(see page 89)* before leaving the area.

DO NOT allow engines to idle at shipping doors.

Trailers

Risks

- trips and falls
- amputations
- being caught under a vehicle
- being caught between vehicle and dock boards

USE mechanical restraints, blocks or wheel chocks on trailers being loaded or unloaded.

USE nose jacks that can support the load and the material moving equipment. Built-in nose jacks may not be strong enough for some loads.

SUPPORT trailers with movable tandem wheels by jacks at the rear, or have the tandem moved to the rear to ensure freight and trailer stability for loading or emptying.

CHECK inside trailers for hazards such as broken planking, holes, unstable freight, and structural damage. Repair before starting work.

ENSURE that lighting in the trailer is adequate for moving freight, reading labels and seeing hazards. A recommended minimum is 10 Candlepower.

PROTECT temporary lighting and cabling to prevent damage or shorts.

REMOVE obstructions, debris and unused blocking before loading a trailer.

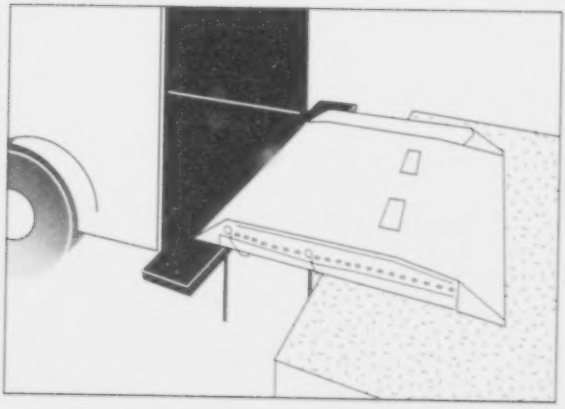
BRACE heavy or unstable items inside the trailer to prevent shifting.

FOLLOW hazardous materials procedures established by your employer.

DO NOT rely on trailer brakes as the only means to keep a trailer positioned correctly at the loading dock.

DO NOT place temporary wires, hoses or cables where they can be run over or tripped on.

DO NOT enter a trailer which contains hazardous materials if you notice any leaks, spills or dusts.



Dockplates (Ramps / Gangways)

A dockplate is a ramp between the loading dock and the trailer or railcar being loaded or unloaded. Dockplates are either metal plates manually placed or hydraulic plates built into the loading dock.

Risks

- slips, trips, falls
- being caught between vehicle and dockplate
- dropping off the edge

ENSURE the dockplate will support at least four times the load planned including the freight and material moving equipment.

MAINTAIN a non-skid surface.

CLEAN spills, oils, grease and moisture from the plate.

ALLOW enough width (about a metre or 39 inches) for easy manoeuvering of industrial power trucks and carts.

ENSURE plates are flush with the surface to minimize movement and wear at the edges.

GUARD all shear points.

ENSURE the edges have a lip to prevent mobile equipment from going over.

MARK the edges of the plate with paint to identify tripping points and prevent accidentally dropping off the edge.

INSPECT hydraulic dockplates regularly. A certified person must inspect them at least once a year.

CHECK manual dockplates regularly for signs of wear, corrosion or failure of the materials or welds.

USE anchor devices to ensure the plate does not move when in use.

USE handholds or loops to allow a forklift to move dockplates.

DO NOT drop or throw a dockplate.

DO NOT assume a plate is anchored. Check it before using it.

Section VI

Manual Materials Handling

1. General Safety Tips on Lifting and Moving

- Manual Lifting
- Transferring Weight
- Carrying
- Pushing and Pulling

2. Specific Methods for Specific Container Types

- Bags
- Bales
- Barrels
- Boxes and Cartons
- Crates
- Cylinders (gases)
- Drums
- Carboys
- Storage
- Pallets
- Plate Glass
- Sheet Metal
- Long Objects
- Rolls
- Flat Circular Items

1. General Safety Tips on Lifting and Moving

Risks

- back injury
- muscle and joint injury of the hands, shoulders and waist
- strains, sprains, slips, falls

WEAR safety shoes and gloves.

WARM up (stretch your muscles) before lifting.

MINIMIZE manual lifting. Design the workplace to avoid lifts or transfers. Use mechanical aids such as hoists and transfer tables.

KNOW the weight of an item which you plan to lift. Get help for heavy or bulky items.

GRIP with the whole hand, not just the fingers. The palms of the hand have the greatest gripping area and strength.

AVOID grasping areas near pinch and shear points or the ends of long items.

KEEP the load close to your body. Face in the direction of the lift to avoid having to turn as the final action of a lift.

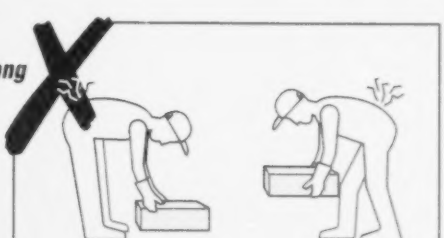
LET your legs do the lifting, not your back. When turning, use your legs and your feet.

LIMIT lifts to the range between your wrists and your shoulders.

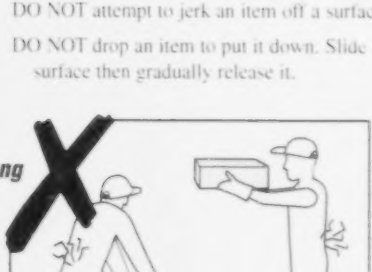
PLAN before lifting. Anticipate distance, stairs, ramps and obstacles, and know where to set the load down.

PLAN for clearance to avoid getting pinched hands or fingers.

PLACE items on blocks or shims on flat surfaces to avoid getting pinched fingers.



- DO NOT lift with wet or oily hands.
- DO NOT turn by rotating at the waist.
- DO NOT bend sideways at the waist.
- DO NOT attempt to lift heavy items if you are not in good physical condition or do not lift regularly. Get help or use a mechanical aid.
- DO NOT attempt to jerk an item off a surface to raise it.
- DO NOT drop an item to put it down. Slide it onto a surface then gradually release it.



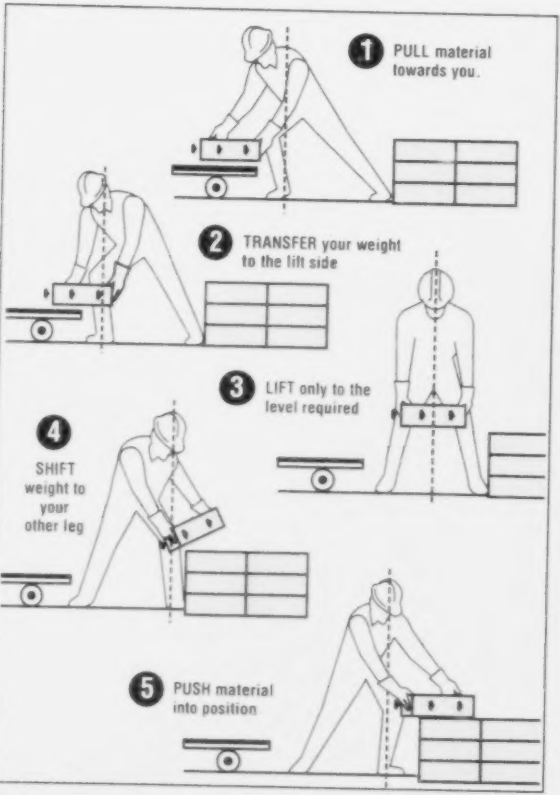
Manual Lifting

STORE and work with materials at waist height when possible
DO NOT BEND over and try to lift item from the floor all at once
1 Raise the item upright
2 PUT one knee against the item
3 RAISE side
4 REST item on edge of knee of other leg
5 PULL up the leg
6 STAND upright

Transferring Weight

REDUCE the load on your back by transferring weight. Shift your body weight from one leg to the other. Avoid twisting your back. Momentum helps move the load.

USE the following sequence of motions for moving heavy or bulky materials:


1 PULL material towards you.
2 TRANSFER your weight to the lift side
3 LIFT only to the level required
4 SHIFT weight to your other leg
5 PUSH material into position

Carrying

☑ GET assistance from a co-worker if the load is too heavy and /or too large.

KEEP the load close to your body.

FACE in the direction you are travelling.

WATCH where you're going.

WATCH for tripping hazards.

WALK at an easy pace.

GRIP under the object and use your whole hand.

MAKE more than one trip or use a cart rather than try to carry too much.

USE the handrail as a guide and to help your balance on stairs and ramps.

☒ DO NOT run.

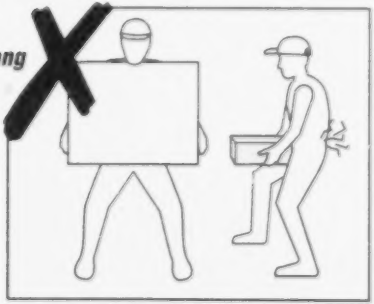
DO NOT allow the object you're carrying to obstruct your vision.

DO NOT attempt to carry heavy objects too far. If you need to rest, place the package on a solid object and rest or get assistance.

DO NOT hurry up or down stairs or ramps.

DO NOT attempt to take more than one stair at a time.

DO NOT carry items by the straps or packaging cord.



Pushing and Pulling

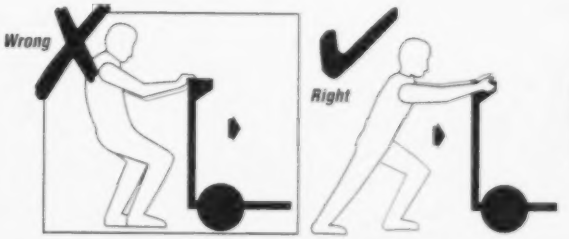
WEAR safety shoes with backs high enough to protect your ankles from being caught by the edge of the cart if possible.

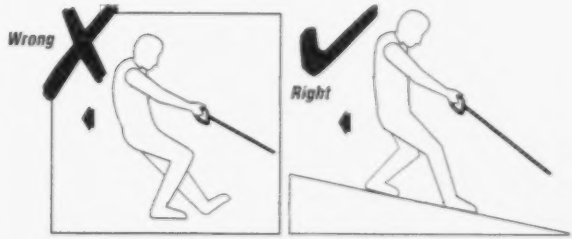
KEEP your back straight and your head in line.

PUSH a cart rather than pull it, when on a flat surface.

PULL a cart up a ramp using your legs and keeping your back straight.

WATCH for obstacles and other workers.





2. Specific Methods for Specific Container Types

Bags

- KNOW the weight of an object before attempting to lift it.
- KEEP legs flexed and back straight when lifting and carrying bagged materials.
- GRASP the bag by the sides or ends to transfer it or place it on a cart.
- LIFT by grasping at opposite corners. When the bag is upright, rest it on a solid item or on your hip, then swing it to one shoulder.
- CARRY the bag with one arm, on your side. Support the load with your hips, arm, shoulder and back. Use the other hand at the front of the bag to stabilize the load.
- LOWER the bag by following the lifting process in reverse order.

Bales

- WEAR hand protection (and respiratory protection if the contents can create dust.)
- USE large-tongued two wheel carts to move bales.
- STACK bales with caution. Stacks tend to be unstable and should be well braced or contained in cribs.

Opening

Bales are usually secured by strapping, wire or cordage or consist of sacks tied with wire. These binding materials are usually under a lot of stress.

- WHEN OPENING a bale, hold the ends of the binding material to prevent them from flying free. Stand clear of the free ends.
- WEAR eye protection.

Barrels

ENSURE that a wooden barrel is in good condition before moving it—hoops intact, no split slats, no cracked or broken ends, no nails or slivers protruding.

KNOW the weight and contents of a barrel before attempting to move it.

USE clamp carts or drum tilters to move barrels. If neither is available, use a cart with two large wheels.

CONTROL the direction of rolling by gripping the chime with a gloved hand.

GET HELP from a co-worker when rolling a barrel on a ramp or other incline. Use ropes or other restraints on steep inclines.

Opening

To open a barrel, remove one end.

REMOVE the nails holding the top and the upper hoops.

DO NOT kick a barrel.

DO NOT roll a barrel off a step or ledge.

DO NOT stand below a barrel on an incline.

Boxes and Cartons

GRASP under the sides to lift, and move when possible.

RAISE from a flat surface by grasping the lower corner nearest your body and the opposite upper corner.

LIFT from the floor by raising the closest end onto your leg then grasping the opposite side.

DO NOT lift by the tape, strapping or other packaging materials.

Crates

ALWAYS assume a crate is heavy. Check the weight.

USE carts and other mechanical aids with crates.

Cylinders (gases)

WEAR gloves and safety shoes.

KNOW the contents and their hazards before working with cylinders.

CHAIN, strap or otherwise restrain cylinders at all times, including during transit or storage, or while manually handling.

ENSURE that the valve protector cap is in place and properly screwed on, until the cylinder is to be connected.

MOVE cylinders using special gas cylinder carts with straps and a stable base which will remain upright if the cart is released.

DO NOT roll, drop, drag or slide cylinders.

DO NOT allow cylinders to collide.

DO NOT remove content label or hazardous warning labels.

DO NOT accept improperly or unclearly marked cylinders.

DO NOT rely on colour coding.

DO NOT accept or handle cylinders that don't have a protective cap.

DO NOT accept damaged cylinders.

Drums

WEAR gloves and safety shoes.

USE drum tilters to move drums. If none is available, use a cart with two large wheels.

SLIDE drums down ramps or skids endwise.

USE drum openers to open drums. They leave a smooth, rolled edge.

DO NOT roll drums, especially down a skid.

DO NOT store or transport drums on their sides except in a cradle or rack designed for that purpose.

Tipping and Standing

☑ KNOW the weight of the drum and contents before attempting to tip or stand a drum. Use lifters or get help if the drum is heavy.

USE special carts designed to assist with tipping and standing drums, if such carts are available.

To tip a drum manually:

1. PLACE one foot against the bottom of the drum, with the other foot extended back so your legs are well apart.
2. GRIP the far top edge of the drum with one hand and pull. Have the other hand ready to steady the drum and control sideways rolling.
3. LOWER the drum to the floor.

To Stand a Drum

It may be necessary to brace the drum from sliding on floor surfaces.

☑ STAND at the end of the drum with feet together.

CROUCH and grab under each side of drum end with hands about 45 cm apart.

LIFT by straightening your legs.

Carboys

ALWAYS ASSUME CARBOYS CONTAIN HAZARDOUS MATERIALS.

☑ WEAR gloves and safety shoes and any other personal protective equipment appropriate for the hazardous materials contained in the carboy.

USE special long-handled carts to pick up carboys or boxes of carboys. The handles are designed to protect workers from getting splashed in the event of leakage.

☒ DO NOT stack un-boxed or un-crated carboys.

DO NOT stack crated or boxed carboys by more than three.

Storage

- ☑ STORE corrosive materials in areas designed to contain spills and corrosive vapours. Emergency exhausts should be available in such areas.
- HAVE adsorbent and neutralizing materials available.
- HAVE an emergency response plan. Personal protective equipment must be on hand. Training must be provided.
- USE containment trays large enough to hold the contents of the carboys. The trays should be under each carboy or stack of carboys.
- STORE incompatible materials in separate designated areas.

Pallets

- ☑ ENSURE that pallets have about 20 cm clearance for forks and front wheels to go in.
- CHECK pallets to make sure that there are no broken or damaged planks, and no loose or missing hardware. A routine pallet inspection process should be in place.
- ENSURE that pallets are strong enough for the load placed on them so they do not bend or break when lifted.
- USE solid top or closely spaced planks for bags and other flexible materials.
- ☒ DO NOT pile pallets over 1.5 (5 feet) metres high.

Plate Glass

- ☑ WEAR safety shoes with metatarsal guards and leather gauntlets with heavy cuffs.
- WEAR leather aprons, safety sleeves and leg protection for larger pieces.
- USE vacuum holders, spreaders, frames or other mechanical devices to lift and move glass.
- USE "A" frames on carts or glass carts to move glass longer distances. Always have two people move the cart—one in front and one behind.

CARRY the glass by hand. Rest the glass on the protected palm of one hand and hold the glass at the top with the other hand.

TAPE edges of glass, to make them more visible so that people don't walk into them.

☒ DO NOT carry more than one piece.

DO NOT hold glass under your arms.

DO NOT allow the glass to bend.

DO NOT place the glass on a surface where it could get scratched.

Sheet Metal

☑ WEAR leather or other cut-resistant gauntlet-style gloves.

USE grabbers or lifters for heavier sheets.

Long Objects

☑ WEAR hand protection, a hard hat, shoulder pads and safety shoes.

FACE in the direction of movement.

USE two people, one at each end.

USE straddle carts or trucks when possible.

CARRY materials on the shoulders when practical.

Rolls

☑ WEAR safety shoes and gloves.

MOVE small rolls by using a two-wheeled hand cart or by placing the rolls between chocks on a flat cart.

USE specially designed carts for larger rolls.

Flat Circular Items

- ☑ WEAR gloves and safety shoes.
- MOVE using a two-wheeled cart.
- STRAP or chain the items to be moved.
- ROLL the items for short distances. Use extreme care if the items are heavy or inclined to topple due to narrow edges.

Section VII

Materials Handling

1. Shipping and Packing

- Sealers and Glue
- Strapping
- Shrink Wrap, Bag Sealers and Plastic StrappingWelders
- Picking

2. Materials Handling Equipment

- Carts
- Conveyors
- Hoists
- Jacks
- Rollers and Dollies
- Tools

1. Shipping and Packing

Risks

- finger or hand injuries
- back injuries
- leg and foot injuries
- exposure to toxic chemicals
- eye injury if the strapping breaks and snaps in the eyes

Sealers and Glue

Sealers are used as coatings to waterproof items for shipment. Glues are used to seal containers and attach labels.

Risks

- toxic vapour exposure

☑ USE plastic sealers or cold asphalt compounds rather than pitch.

CHECK the MSDS for specific hazards of the materials being used.

WORK IN A PROPERLY VENTILATED area. Vented hoods or other local exhaust systems may be required.

USE recommended personal protection (PPE). This may include:

- goggles and face masks
- heat and chemical resistant "gauntlet" style safety gloves
- heat and chemical resistant full aprons

USE the following PERSONAL PROTECTION WHEN WORKING with plastic or cold sealants

- splash-proof safety glasses
- chemical resistant safety gloves
- arm and body protection
- full apron

Strapping

☑ USE safety goggles and leather gloves when working with strapping.

USE steel-reinforced gloves with heavy strapping.

FACE in the direction of the pull and be prepared in case strapping breaks; it could snap in your eyes.

STAY out of the direct line when the strap is under tension.

CUT off excess strapping and sharp or pointed ends using metal snips (cutters) and REMOVE any broken or damaged bands.

ANCHOR the closest end either with your gloved hand or a holding device before cutting.

DISPOSE of waste strapping immediately. It can be a serious tripping hazard.

☒ DO NOT use extra force to tighten straps beyond the machine design.

DO NOT lift a package by the strapping.

DO NOT remove strapping by breaking it with a hammer, bar, chisel or other tools.

Shrink Wrap, Bag Sealers and Plastic Strapping Welders

Risks

- burns from machines used to seal, shrink and weld plastic
- exposure to toxic plastic fumes

☑ CHECK material safety data sheets (MSDS) for potential hazards and safe working procedures.

WORK in ventilated areas. Localized exhaust is preferred.

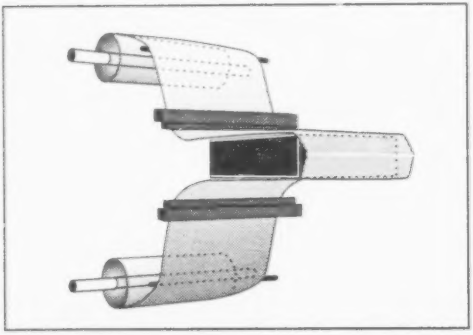
WEAR heat-resistant gloves.

KEEP hands and materials clear of the heating elements.

OPERATE units at the lowest temperature practical. Check the manufacturer's recommendations.

☒ DO NOT speed up the operation by increasing the heat. This can result is greater fume production, and material failure.

DO NOT stand or bend over the process area for better visibility.



Shrink Wrap

Picking

Packers collect smaller items together for shipments. These items are usually located on shelves, in bins or on racks which often extend to the ceiling.

Risks

- falls
- muscle strains
- back injury
- exposure to toxic chemicals

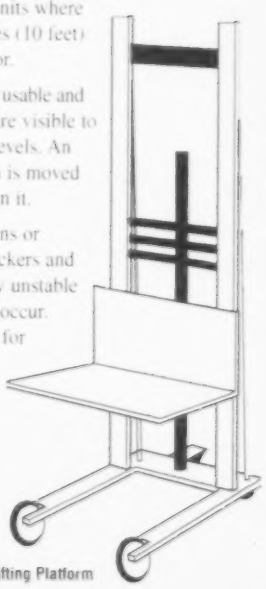
☑ USE only heavy-duty, stockroom or platform (order-picking) ladders.

ENSURE there are guardrails on mechanized order picking platforms.

USE fall protection for units where the operator is 3 metres (10 feet) or more above the floor.

ENSURE that mirrors are usable and markings or warnings are visible to the operator from all levels. An order picking platform is moved while the operator is on it.

WORK as close to the bins or shelves as possible. Pickers and platforms are generally unstable when sideways forces occur. They are not designed for reaching or for unbalanced loads.



Lifting Platform

DO NOT climb on shelves to reach items.

DO NOT lift heavy or bulky items over guardrails. Use forklifts or other lifting platforms.

DO NOT move pickers or platforms without warning others and checking for other traffic, particularly if entering or crossing an aisle.

DO NOT operate in an area where the platform or operator is near electrical power lines or lights.

2. Materials Handling Equipment

Risks

- slips, trips, falls
- crushed hands
- collisions

General

KNOW the weight of the object to be moved.

KNOW the capacity of the handling device to be used.

Carts

USE a cart designed for the job.

WEAR gloves and safety boots when using carts.

USE carts with the largest diameter wheels practical.

USE carts with hand guards.

PUSH carts when possible. Pushing is easier on the back than pulling, and prevents the cart from catching your heels.

Lift Cart

PUSH from the end, not the sides.

WALK at a normal or slow pace when pushing a cart.

PULL carts through swinging doors.

ANCHOR unstable or top heavy loads.

STORE carts in designated areas with handles in the up position. Remove removable draw handles and store separately.

LUBRICATE wheel bearing and other moving parts on a regular basis.

DO NOT drop wheels off the edges of bridge plates or platforms.

NEVER stand on a cart or use it to transport workers.

DO NOT cut corners or pass too close to obstacles or walls— avoid jamming your hands.

DO NOT overload a cart or pile materials which obstruct your view.

DO NOT use a damaged cart, particularly a cart with faulty wheels.

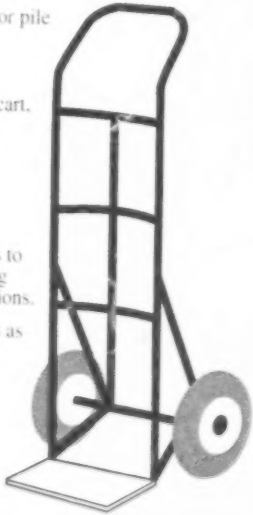
Two-Wheeled Carts (hand trucks)

PROVIDE knuckle guards to protect hands from being jammed against obstructions.

USE carts with the wheels as far forward as practical.

KEEP FEET CLEAR of the wheels.

STORE carts with the tongue under a pallet, shelf, or table.



Hand Truck Dolly

To Load Horizontally

- Tip the load to be lifted slightly forward.
- Slide the tongue of the truck under the load.

To Load or Unload Vertically

- Load the cart with the center of gravity as close to the wheels as practical.
- Raise by lifting with the leg muscles. Keep back straight.
- Lower using the leg muscles. Keep back straight.

LOAD heavy objects below lighter objects.

ON RAMPS, always control the cart from the high side.

STRAP all containers which are fragile or under pressure.

ENSURE the load will not slip, shift, or fall. Use straps for large or unstable loads.

MOVE the cart by tipping so the weight is carried by the axle and not by the handles.

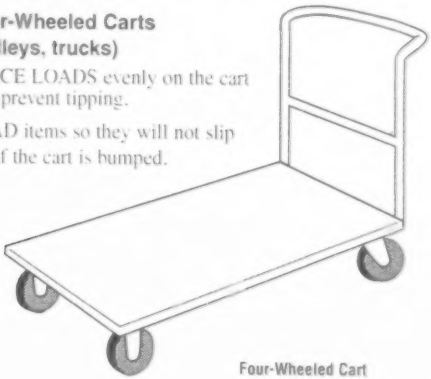
☒ DO NOT leave a cart where someone can trip over the tongue.

DO NOT walk backwards when travelling with a cart.

Four-Wheeled Carts (trolleys, trucks)

☑ PLACE LOADS evenly on the cart to prevent tipping.

LOAD items so they will not slip fall if the cart is bumped.



Four-Wheeled Cart

PUSH carts from behind on level floor.

SEEK HELP of a co-worker to move high carts or carts with high racks on the truck: one person at the front, the other at the back.

ENSURE that handles are at protected places on the racks or body of the truck so that traffic, walls, or other objects being passed will not crush or scrape the operator's hands.

☒ DO NOT load in a manner that obstructs the operator's vision.

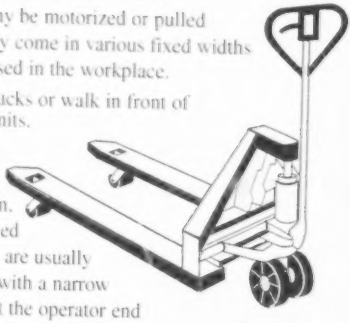
NEVER ride a cart.

Pallet Carts (Manual Forklifts)

Pallet carts may be motorized or pulled manually. They come in various fixed widths to fit pallets used in the workplace.

☑ PULL hand trucks or walk in front of motorized units.

ENSURE the load on a pallet is even. Hand operated pallet trucks are usually constructed with a narrow wheelbase at the operator end to increase manoeuvrability.



Pallet Cart

WALK slowly. Loads on pallets are generally heavy and difficult to stop quickly.

BACK pallet carts down ramps or into closed areas such as elevators.

LUBRICATE the wheels and mechanical or hydraulic handles regularly.

ENSURE the lift mechanism is adjusted properly so the forks remain level as they lift.

☒ DO NOT ride a hand truck unless an area with proper guarding is provided for that purpose.

DO NOT use the forks as levers or automatic pry bars.

DO NOT move wide loads with narrow carts. Wide loads will be very unstable and will tip when turning.

DO NOT use the cart if the fork wheels are out of alignment or the forks lift unevenly.

Conveyors

General

When working near any conveyor:

☑ WEAR hard hat and safety shoes.

RESTRAIN long hair.

KNOW the location of emergency "shut-off" devices and how to use them.

☒ DO NOT wear loose clothing or jewellery.

DO NOT climb on conveyors.

Gravity Conveyors:

- rollers, wheels or chutes

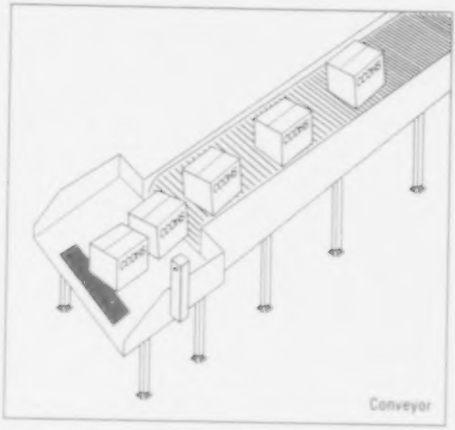
☑ GUARD pinch points on rollers and wheels and between the conveyor and receiving table.

PROVIDE adequate guardrails along sides to prevent the largest objects to be handled from falling off.

PROVIDE retarders (friction areas) if heavy objects are conveyed.

ENSURE there are warning devices near the receiving area if you cannot see packages on the conveyor.

ENSURE draft checks (fire doors) are installed where conveyors pass through fire walls or floors.



Power Conveyors: belt, live roller, slat, and bucket

- POSITION yourself so that you are not hit by objects moving down the conveyor.
- ENSURE that you can see the conveyor system when operating the controls.
- ENSURE that guards are in place for all moving parts of the drive system for the conveyor.
- GUARD all pinch points between the conveyor system and fixed objects.
- LOCATE handrails around low level conveyors and areas where conveyors pass through the floor.
- LOCATE emergency stop cut-offs near the operator and along the length of the conveyor at least 30 metres (100 feet) apart.
- GROUND belts on belt conveyors to prevent static buildup.

☒ DO NOT service the conveyor without following LOCKOUT procedures *(see page 22)*.

Aerial Conveyors

☑ ENSURE that guards are in place to protect workers below from falling objects.

Bucket Conveyors

☑ ENSURE that both vertical and horizontal bucket conveyors are totally enclosed.

Pneumatic Conveyors

☑ FAMILIARIZE yourself with control devices and release valves to cut off air flow in the event of blockage.

SHIELD joints and access points to prevent material from being thrown in the event of gasket failure.

ENSURE that screening is in place at the suction end to prevent large items from being sucked in.

Portable Conveyors

USE only weatherproof electrical components.

ENSURE power cables are located where they won't be walked on or run over.

ENSURE that sideboards are high enough to prevent large items from falling and smaller items from being thrown by the wind.

CHOCK trucks and railcars that are being loaded or emptied with portable conveyors.

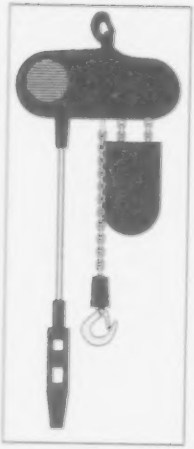
DO NOT exceed the rated load capacity of the conveyor.

Hoists

Hoists are used for light duty work (up to about 2 tonnes) and are manually or electrically operated. Air operated units are also available, in some locations.

Chain Hoist

- ☑ WEAR a hard hat, gloves, and safety shoes when operating a hoist.
- ENSURE that the maximum load rating is clearly marked on the hoist and the user knows it.
- USE limit switches and passive brake systems. These are often built into the winch unit.
- ENSURE that hooks have safety catches to prevent the load from slipping off.
- ENSURE all slings, cables, ropes, hooks, fittings and winches are strong enough to handle the load.
- INSPECT all cables, slings, fittings and ropes before each use. If the unit is used continuously, schedule inspections at least daily. The winch must be fully inspected and serviced at least annually by a qualified person.
- MINIMIZE pinch points for cables by using rounding edges or thimbles.
- ENSURE the controls are clearly marked and designed so they can be operated by feel. They must operate only when the controls are being manually activated.



Electric Chain Hoist

ENSURE loads are lifted straight up. Hoists and hoist mounts are not designed for side stresses.

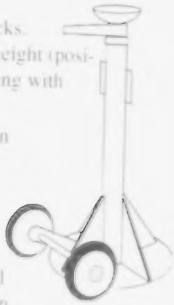
STAND CLEAR of the fall zone and whip area while cables are under tension.

DO NOT use equipment which shows signs of damage or weakness such as corrosion, wear, frays, kinks, or unusual twists.

DO NOT stand under or near a suspended load.

> Note: Cranes and crane rigging require special precautions and training. Contact your local Labour Ministry office or Safety Association for assistance.

Jacks



Jacks are used to raise items on blocks. They are also used to maintain the height (position) of a dropped trailer when loading with forklifts.

WEAR safety shoes and gloves when using jacks.

USE only industrial-grade jacks.

KNOW the weight being lifted. Ensure the jack, the base (area of the floor or ground the jack will rest on) and shims or extenders can support the load.

STAND clear to prevent being hit or caught if load shifts.

ENSURE the surface the jack base sits on is flat and level. Use blocks to level the area if necessary.

PLACE a hardwood shim between the jack and the load to minimize slipping when jacking metal objects.

USE jacks for vertical lifts only. If angle lifts must be carried out, special blocking and stabilization of the item being lifted is essential.

RAISE alternately in small steps when using two jacks to lift one item. This ensures an even distribution of the load.

ENSURE no one stands in the jack handle kick area.

INSERT blocks under the load as the item is raised. Heavy wooden blocks are ideal.

DO NOT use ratchet jacks that have broken or damaged teeth.

DO NOT use hydraulic jacks which are leaking fluid.

DO NOT use a screw jack without anchoring the base to prevent rotation.

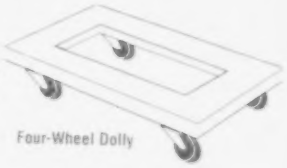
DO NOT operate a jack handle with oily or wet hands.

DO NOT place jacks on a surface which is oily, wet or covered with any waste materials.

DO NOT leave handles in the jack sockets when they're not being used.

DO NOT place hands or feet under a load being lifted.

Rollers and Dollies


Four-Wheel Dolly

Rollers and dollies are used to move very heavy or bulky items.

WEAR safety shoes when using rollers or dollies.

USE bars to move and adjust rollers.

LOCATE rollers or dollies under the blocked item when transferring a load from jacks. Use the jacks to lower the item.

CHOCK wheels when transferring a load from a crane or hoist.

REMOVE chocks with a bar, not by hand.

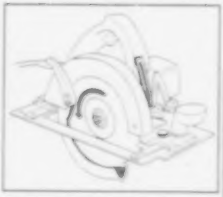
DO NOT reach under an item on rollers.

DO NOT use your hands to hold rollers being placed in front of the load.

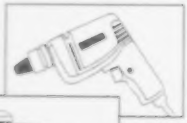
Tools

Hand-Held Power Tools

Nailers, saws, drills, power screwdrivers, shears, staplers, etc. are hand-held power tools. For each of these tools, follow the manufacturer's recommendations for safe use.



Circular Saw



Drill

Jig Saw

Risks

- cuts and amputations
- electrical shock
- burns
- exposure to toxic substances
- eye injuries
- injury of the hands, wrists, back, shoulders and neck
- noise

FOLLOW manufacturer's operating instructions.

WEAR safety glasses and snug-fitting clothes. When operating tools which can throw particles, use a face shield.

USE hearing protection when operating a noisy tool such as a power saw or when working near one.

RESTRAIN long hair with a cap or net and remove jewellery.

USE the correct type of tool for the job.

USE electrical outlets with Ground Fault Circuit Interrupter (GFCI) to protect yourself from shocks. This is particularly important in damp or exposed areas.

USE low voltage (battery operated) tools or ensure tools are double insulated or properly grounded.

KEEP cutting edges sharp and clean, and keep tips free of burrs and defects. Improperly maintained edges and improper contact can cause tools to overheat or become unstable.

DISCONNECT power before making adjustments or replacing a cutting blade or tip.

INSPECT all tools and electrical cords regularly.

ENSURE the material being worked on is stable. Use clamps or other holding devices if necessary.

DO NOT operate a tool without the guards and interlocks in place and in good condition.

DO NOT use extension cords which have had the ground plug removed.

DO NOT operate tools in areas containing flammable gases or vapours.

DO NOT use power tools in areas which are unstable or slippery due to spills.

DO NOT force tools. If a tool seems slow or weak, check the condition of the working edges.

Hand-Held Manual Tools

Risks

- cuts and amputations
- burns
- exposure to toxic substances
- eye injuries
- injury of the hands, wrists, back, shoulders and neck

WEAR eye protection with side shields when using any hand tool where blows will be struck or particles could be thrown.

USE hand guards with chisels and other tools which are normally struck.

USE good quality industrial grade tools. Consumer grades of many tools are not designed for heavy or continuous use.

CARRY sharp tools pointed down or away from your body. A fall or slip can result in serious injury.

STORE sharp tools separately with their blades covered.

USE the appropriate size of tool for the forces required.

DISPOSE of tools which are bent, corroded, or excessively worn.

DO NOT extend the handles of tools unless they are specifically designed for extensions.

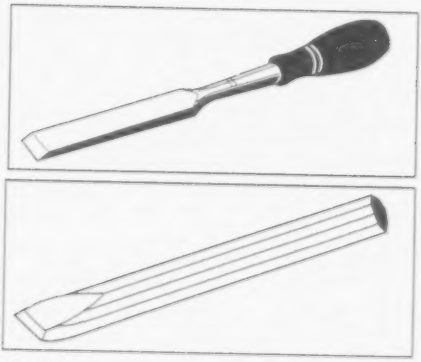
DO NOT leave tools lying around where they can become a tripping hazard.

Chisels

- [x] WEAR eye protection.

PROTECT your free hand.

USE chisels with hand guards or chisel holders when possible.



Chisel

- [x] KEEP the cutting edge sharp and hardened. When sharpening do not let the tip heat.

SELECT the correct size for the job.

SELECT a hammer which matches the size and force needed for the chisel being used.

DO NOT use a chisel with a damaged or broken struck end.

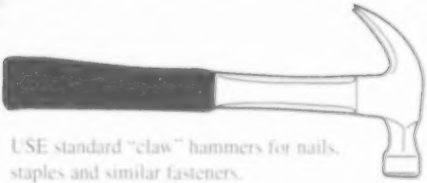
DO NOT use a chisel which is bent, cracked, or chipped.

Hammers

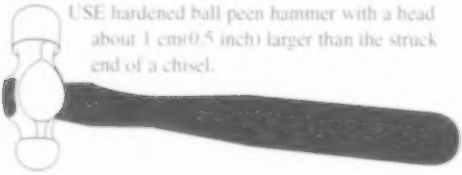
WEAR eye protection.

USE a hammer of the right weight and size for the job.

ENSURE the handle is secure so the head doesn't fly off.



USE standard "claw" hammers for nails, staples and similar fasteners.



USE hardened ball peen hammer with a head about 1 cm(0.5 inch) larger than the struck end of a chisel.

ENSURE the hammer handle is clean, dry and not slippery.

HIT the struck object straight.

DO NOT use a hammer that has a worn or damaged face.

DO NOT use one hammer to strike another.

DO NOT use an ordinary nail hammer to drive hardened steel nails.

Pliers

USE the correct size and type of pliers.

KEEP pliers clean and lubricated.

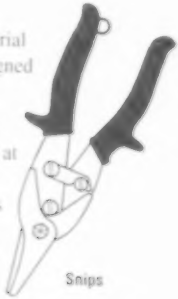
DO NOT use pliers with damaged jaws or guides.

DO NOT use pliers as a wrench. Pliers compress as they exert force which will damage bolts, nuts or fittings.

DO NOT extend the handles on a pair of pliers or use force beyond hand pressure.

Snips and Cutters

Snips have jaws like scissors. Material will curl off the cut. Snips are designed for flat sheet materials.


Snips

Cutters have blades both angled on the same side so they throw material at a right angle to the cut. Cutters are used for heavier and round materials such as bars, cables and wires.

- ☑ WEAR eye protection and gloves.

KEEP the jaws of snips and cutters tight and well lubricated. When replacing parts during servicing ensure springs for left and right cutters are the correct orientation.

USE snips and cutters of correct size. Switch to larger sizes with longer handles for heavier or harder materials.

Cutters

ANCHOR material being cut to keep it from flying or interfering with the cut.

TAKE special precautions when cutting metal or plastic bands that are under tension. They may whip with considerable force when cut.

- ☒ DO NOT use snips to cut round objects such as wire or nails.

Wrenches

- ☑ USE the correct size of wrench.

USE metric sized wrenches for metric fasteners and Imperial sized wrenches for Imperial fasteners.

USE sockets or box wrenches instead of open-ended wrenches when possible.

AVOID locations where hands can be scraped or pinched if the wrench slips.

DO NOT extend a wrench to increase leverage.

DO NOT use an adjustable wrench when a lot of force is required.

DO NOT use sockets from hand wrenches in power or pneumatic impact wrenches.

DO NOT strike a wrench with a hammer unless it is specifically designed for striking.

Spark-Resistant Tools

Spark-resistant tools may be used in areas where flammable gases, volatile liquids, or explosive substances are stored or used.

ASK your supervisor to make sure that it is safe to use a particular tool in an area with potential for spark.

INSPECT often as the working edges of these tools are not as hard as steel tools.

ENSURE foreign particles that could produce friction sparks don't get imbedded in the working surfaces.

Powered Vehicles for Moving and Lifting

1. Personal and General Safety

- Loads
- Trailer Loading
- Batteries
- Fuel

2. Motorized Vehicles

- General Safety Tips
  - Electric Hand Trucks (Walkies)
  - Forklifts
  - Stock Picking Lifts
  - Side Loading and Straddle Trucks
  - Tow Motors and Tractors
  - Automated Guided or Electronically Controlled Vehicles
  - Cranes
  - Crane Trucks and Boom Trucks
  - Rigging

1. Personal and General Safety

- ☑ WEAR safety shoes at all times when working with power equipment.
- REPORT all accidents involving personnel, building structures, storage units and equipment.
- GIVE warning when overtaking and passing.
- GIVE pedestrians the right of way.
- ENSURE that no people or objects are behind before backing up.
- KNOW the capacity of your equipment and DO NOT exceed it.
- CHECK clearances before moving high loads.
- TRAVEL at a speed which allows stopping within 2.5 metres (8 ft) in wide aisles and 1 metre (3 ft) in narrow aisles or near obstacles.
- TRAVEL with the load low and where possible, tilted back. Elevate a load only during stacking.
- SLOW down on wet or slippery services.
- SLOW down and sound horn at cross aisles and other locations where vision is obstructed.
- TRAVEL with the load trailing when a load obstructs the forward view.
- DECREASE speed and load when operating on ramps.
- ☒ DO NOT drive or push a load toward someone standing in front of a fixed object.
- DO NOT walk under an elevated object.
- DO NOT cross a dockplate without ensuring it is properly anchored and the vehicle is chocked.
- DO NOT ride on freight moving equipment unless it is specifically designed for an operator and other workers.

DO NOT pass another vehicle travelling in the same direction at intersections, blind spots or other dangerous locations.

DO NOT skid the wheels on powered equipment.

Loads

☑ ENSURE all loads are properly stacked and stable before lifting or moving. If a load cannot be centered use extra precautions.

ENSURE any attachments used are secure and properly positioned.

Trailer Loading

☑ ENSURE that the trailer is capable of bearing the load.

CHECK for debris or damage such as holes or uneven trailer floors.

SECURE dockplate.

ENSURE trailer wheels are chocked.

ENSURE the landing gear is down if trailer is unhooked.

CHECK overhead clearance.

PLAN ahead for unstable, extra heavy or irregular loads.

☒ DO NOT use a motorized device to push a heavy item over a dockplate onto a truck.

Batteries

Batteries may be charged in the powered equipment or exchanged for replacement cells to allow continuous use of equipment.

Risks

Battery acid can cause burns. If the acid gets in eyes it can cause blindness.

The battery recharging process produces hydrogen gas, which can explode if allowed to build up where ignition is present.

Battery-charged power supplies can cause electrocution.

- [x] EXAMINE battery for acid leaks, dirt, and debris. Clean or replace if necessary.
- [ ] READ the procedures manual for battery charging and battery replacement and get adequate training.
- [ ] ENSURE replacement batteries on powerlift tracks are all the same size and weight as the original batteries.
- [ ] WEAR protective gloves and apron, and acid-proof goggles or full face protection, when handling batteries.
- [ ] KNOW the location of eyewashes and safety showers.
- [ ] CHARGE batteries in a dry and well ventilated area free from sparks, flames and ignition sources.
- [ ] ENSURE all metal tools and moving equipment used around batteries are insulated to prevent accidental short circuits.
- [ ] ENSURE brakes are set or wheels are chocked on all equipment having batteries charged or replaced.
- [ ] LIFT battery using the lift tabs and proper hoists.
- [ ] FLUSH any acid or alkaline burns with water for at least 15 minutes.
- [ ] CLEAN the charging area and battery compartment regularly. Acid spill residues will cause corrosion.
- [ ] NEUTRALIZE acid spills with recommended product and rinse with water.
- [x] DO NOT place tools or other items on top of batteries.
- [ ] DO NOT charge a leaky battery.
- [ ] DO NOT turn on power to the changer until the battery is connected.
- [ ] DO NOT operate equipment without the battery correctly mounted and all protective covers in place.

Fuel

Risks

- fire
- explosion
- exposure to carbon monoxide, carbon dioxide or exhaust fumes

Monitoring

Employers should monitor carbon monoxide in warehouses where gasoline or liquefied petroleum fuels are being used.

Emission levels must be below the limits set by health and safety regulations.

> In some jurisdictions persons who replace fuel cylinders must be trained and certified. Check the legislation applicable to your workplace.

Propane

READ procedures manual for working with propane and obtain training.

REFUEL or replace cylinders outdoors when possible.

WORK in areas free of all flames and spark sources.

WEAR leather gloves and goggles when refuelling.

USE spark-resistant tools.

CLOSE all valves before removing propane cylinders.

CHECK fittings for leaks before operating equipment.

STORE spare or empty cylinders in a separate fireproof storage area.

DO NOT use corroded or damaged cylinders.

DO NOT perform maintenance on vehicles without removing the gas cylinder.

DO NOT touch escaping propane. The escaping gas will cause frostbite.

Gasoline and Diesel

Gasoline and diesel fuels should generally not be used in confined areas. If they are used, ensure they are lead free.

☑ USE only approved containers (eg. CSA.)

ENSURE good ventilation and continuously monitor the area for carbon monoxide.

KEEP area free of all sources of flame and sparks.

REFUEL outdoors.

KEEP fire extinguishers in the refuelling area.

2. Motorized Vehicles

General Safety Tips

It is absolutely necessary that persons operating motorized vehicles are properly trained.

Risks

- collisions
- falls
- muscle strains
- being caught in between objects
- being struck by falling objects
- being crushed

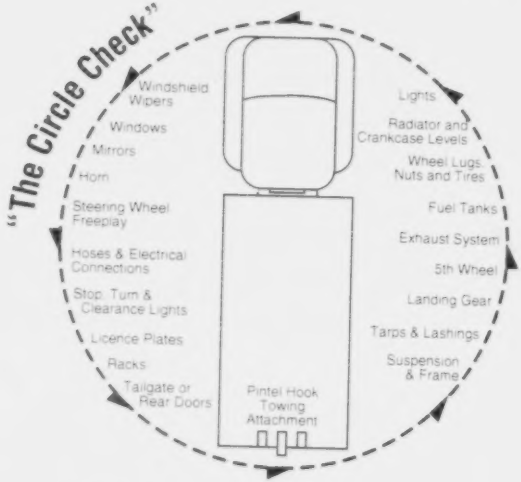
☑ CONSULT your local ministry of labour office for applicable regulations. Some jurisdictions e.g. Ontario have extensive guidelines for the use and maintenance of power lift trucks.

WEAR required personal protective equipment.

READ operating and maintenance procedures before using a vehicle.

INSPECT vehicles before and after every shift. Report all problems to ensure proper repairs.

PERFORM a circle check (see page 89).



REPORT defects and request repairs.

KEEP hands, arms, feet, legs and head inside the operator's compartment at all times when moving or lifting.

ENSURE that overhead guards are in place when operating trucks capable of lifting loads higher than the operator's head, or where there is a hazard of falling objects.

ENSURE all moving parts have the appropriate moving part guards or wheel guards.

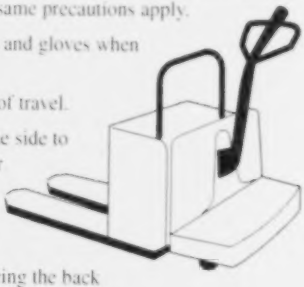
DO NOT attempt to adjust a load on a raised carrier.

DO NOT use a powered vehicle to push items onto a truck.

DO NOT use steering wheel knobs.

Electric Hand Trucks (Walkies)

Electric hand trucks should be operated in the same manner as hand trucks. The same precautions apply.



☑ WEAR safety shoes and gloves when operating.

FACE the direction of travel.

WALK slightly to the side to avoid getting your heels caught by the machine.

WALK backwards down inclines, facing the back of the unit.

BACK unit into tight areas.

RIDE on the truck only if it is designed for a driver and has a proper operator's platform.

ENSURE brakes are automatically applied if the handle is completely raised or lowered.

☒ DO NOT use the blade of a hand truck to push freight. The blade may cut cartons or freight.

DO NOT operate with the battery housing uncovered.

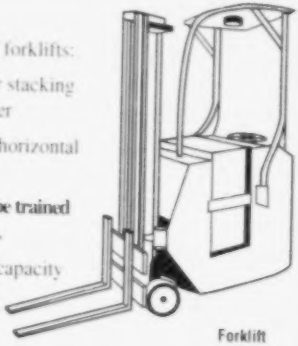
High Lift Walky

Forklifts

There are two types of forklifts:

- high-lift trucks for stacking one load on another
- low-lift trucks for horizontal movement

Fork truck drivers must be trained and authorized opertors.



Forklift

☑ ENSURE that the load capacity is clearly marked on the forklift

FOLLOW forklift rules and procedures manuals.

CHECK forks for wear or damage (bends or cracks) and replace if necessary.

WEAR required personal protective equipment such as hard hats, gloves and safety shoes.

ENSURE adequate overhead and load back rest guards are in place.

INSPECT the load before lifting.

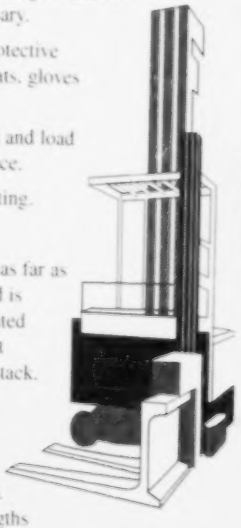
WEAR seat belts.

PLACE forks under the load as far as possible. Lift until the load is clear. With high or segmented loads carefully tilt the mast backwards onto a rack or stack.

DRIVE facing the direction of travel.

DRIVE in reverse when you can't see over the load.

KEEP at least three truck-lengths distance from the truck ahead.



Platform Lift

ATTACH fork extensions and special forks firmly.

PARK safely:

- Fully lower the forks.
- Neutralize the controls.
- Shut off power.
- Set brakes and remove the key.

BLOCK wheels if the truck is parked on an incline.

KEEP safe distance from the edges of ramps or platforms.

DO NOT ride on forklifts.

DO NOT raise loads more than 15 to 20 cm for horizontal travel. The load should be slightly tilted back if possible.

DO NOT operate a forklift unless you are trained to do so.

DO NOT stand on elevated forks or use forks to move workers.

DO NOT place arms and legs or other objects between the uprights of the mast.

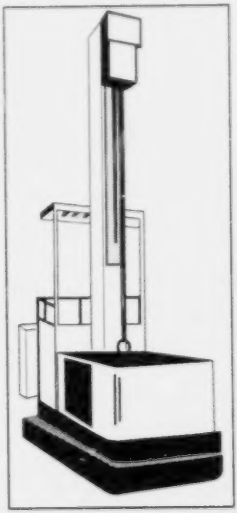
DO NOT raise loads over other workers.

DO NOT walk under a raised load.

DO NOT use forklifts to push objects such as freight, trucks or rail cars.

DO NOT use forklift to force open doors or free jammed objects.

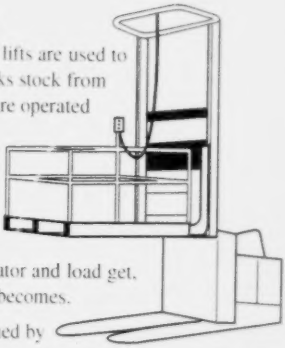
DO NOT exceed the rated capacity or operate with more workers than the unit is designed to hold.



Platform Lift

Stock Picking Lifts

Stock or order picking lifts are used to raise a person who picks stock from shelves. These trucks are operated from a platform.



Stock Picking Lift

Stock lifts do not have outriggers but rely on the weight of the base unit to provide stability. The higher the operator and load get, the less stable the unit becomes.

Operators must be trained by a qualified instructor.

☑ ENSURE the floor is level and free of obstructions before raising the platform.

CHECK for overhead obstructions before raising the platform.

ENSURE platform has guardrails and toe boards.

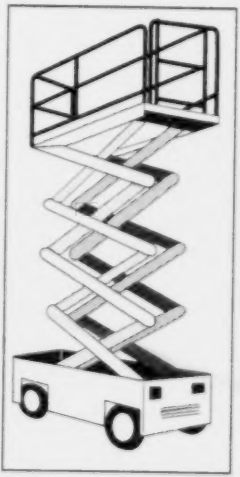
☒ DO NOT overload the platform.

DO NOT load heavy or bulky items by pushing or applying sideways force against either the lift or the shelf units.

DO NOT lean out of the lift or overreach.

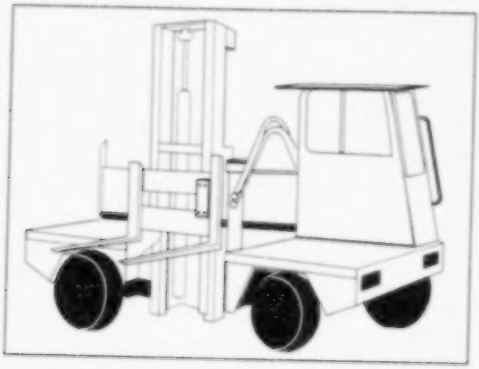
DO NOT use ladders or scaffolding or stack items on the platform.

DO NOT hang items or allow items to hang over the outside of the platform.



Scissors Lift

Side Loading and Straddle Trucks



Side Loading Trucks are designed to move long materials by loading them parallel to the direction of travel.

Straddle trucks are designed to transfer long materials. The truck ha four high legs with a hoist, and a cab normally suspended above and between the wheels.

Side loading and straddle trucks come in many sizes. Only trained and authorized operators should be permitted to operate these vehicles.

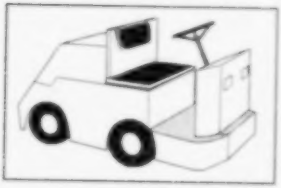
☑ READ procedures manuals and review with other operators.

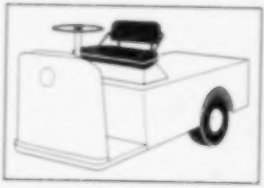
ENSURE that you can see well. If visibility is limited use a second person as a flag person.

USE red flags on the ends of long objects being carried.

USE standard rigging practises when attaching loads.

Tow Motors and Tractors





Tow motors and tractors are used to pull non-powered trucks, trailers and other wheeled items. The safe operating procedures are generally the same as for other material moving equipment.

☑ OPERATE from the operator's platform or seat only.

HITCH loads only to the draw bar or coupling.

ENSURE couplings include locking devices to prevent accidental release of the trailers.

ENSURE the operator's seat is guarded to prevent injury in case the load shifts.

DRIVE slowly. The trailers generally have no brakes.

SLOW down before turning. Ensure adequate clearance for both the tractor and following trailers.

AVOID jack-knifing the trailer. Use the motor to slow down rather than the brakes.

☒ DO NOT stack loads in an unstable or cluttered manner.

DO NOT extend loads beyond the bed of the trailer.

DO NOT carry passengers.

DO NOT coast down ramps in neutral. The motor serves as a brake to prevent unwanted acceleration.

Automated Guided or Electronically Controlled Vehicles

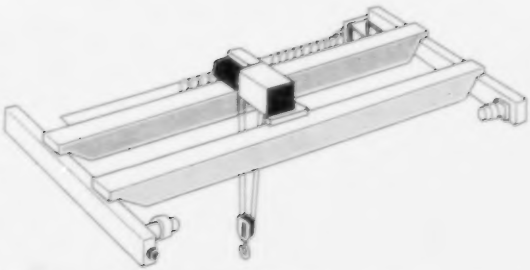
Automated guided vehicles do not need an operator. They follow prearranged routes controlled by sensors which follow light beams or induction tape on or under the floor.

- ☑ FOLLOW manufacturer's operating procedures.
- ESTABLISH speed ranges that are generally slower than for regular materials handling equipment.
- INSPECT the safety systems daily.
- ENSURE automatic vehicles have sensors which will completely stop them if something is in front or approaching at the side near the front.
- ENSURE the front bumpers are secured and extend far enough in front of the truck to allow stopping before the truck can hit an object.
- ☒ DO NOT ride automated trucks.
- DO NOT obstruct aisles used by automated guided vehicles even temporarily.
- DO NOT load or unload while unit is in motion.

Cranes

Cranes are used to move heavy objects.

Cranes may be fixed or mobile overhead units.



The operator may be at grade level, controlling the crane by an umbilical, or in an overhead cab.

Crane operators, signal workers, and rigging workers must be trained in crane operation and rigging by a qualified instructor.

READ the instruction manual before operating a crane.

INSPECT the crane before each shift.

ALLOW only trained and authorized operators to operate a crane.

ENSURE all workers are clear of the load before lifting.

WEAR a safety hat, hand protection, and safety shoes when working near cranes.

ENSURE all hooks have safety catches to prevent slipping.

ENSURE beepers sound when the crane is moving.

ENSURE loads do not exceed the rated capacity of the crane.

LIFT loads straight up. Side drag will cause swinging.

USE tag lines to control swinging and guide the load.

PARK the crane FOLLOWING THESE STEPS:

1. Lower and unhook the load.
2. Suspend the hook in mid position.
3. Lock the brakes.
4. Lock out the controls.

DO NOT use hooks which have opened (turned out) more than 15% at the opening or show signs of twisting.

DO NOT use the crane to lift workers.

DO NOT move materials over other workers.

DO NOT stand on any part of a load or rigging.

DO NOT drag rigging.

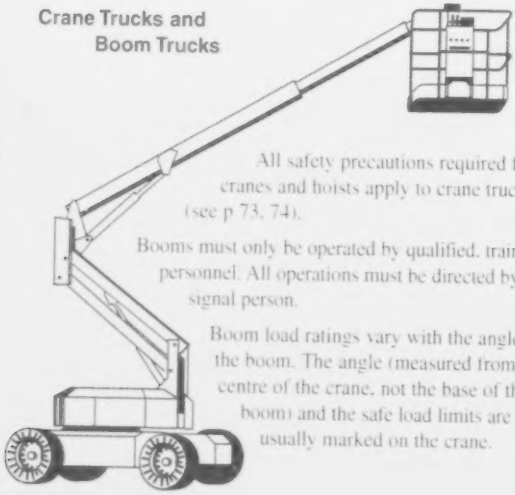
DO NOT lift near electrical power lines.

The following are the minimum safe working distances from high voltage powerlines:

Line Voltages *(all voltage to ground)*	**Minimum Clearance** *Metres*
Up to 125,000 volts	3
125,000 250,000 volts	5
250,000 500,000 volts	8
over 500,000 volts	12

Note: The above clearances apply to both vertical and horizontal directions. If it's necessary to work closer than the minimum distance, authorization must be obtained from the utility company.

Crane Trucks and Boom Trucks



All safety precautions required for cranes and hoists apply to crane trucks (see p 73, 74).

Booms must only be operated by qualified, trained personnel. All operations must be directed by a signal person.

Boom load ratings vary with the angle of the boom. The angle (measured from the centre of the crane, not the base of the boom) and the safe load limits are usually marked on the crane.

ENSURE loads are within the lifting capacity of the boom.

ENSURE that the outriggers are extended and the truck is level, when lifting a load.

USE lowest possible speed and highest possible boom angle.

KEEP load as low as possible when carrying it with a crane.

USE a tag line when moving a long load to keep the load from swinging.

FASTEN the hook to the lower end of the boom to prevent the hook from swinging when moving a crane without a load.

DO NOT walk underneath the boom.

DO NOT climb or stand on the boom or any other parts of the load or load bearing.

Rigging

Rigging is the process of attaching the object being lifted to the hook or eye of a crane or hoist.

Riggers run a high risk of being hit, crushed or run over. They require special training, which includes proper hand signals; working with ropes, chains, slings, chokers, hitches, shackles, bolts and clamps; and other information needed to support a load properly.

ALLOW only fully trained personnel to perform rigging operations.

WEAR required personal protection such as ear protectors, safety shoes, hard hats and gloves.

KNOW the weight of the load to be lifted and the weight rating of the crane.

RAISE loads slowly and steadily to avoid excess straining or slipping.

USE standard crane and hoist signals to ensure the operator, signalmen, and other workers understand their meaning.

INSPECT ropes, chains, slings and lifting accessories regularly.

INSPECT all lifting equipment for faults, frays and other damage before each job.

USE certified rigging equipment and follow the manufacturer's instructions.

KEEP hands clear of all pinch points.

DO NOT make do or use substitute unapproved components.

DO NOT use damaged rigging equipment.

DO NOT walk underneath the boom or a suspended load.

Material Storage

1. **General Safety Tips**
2. **Storage Units**
   - Bins, Silos and Hoppers
   - Pallets and Skids
   - Shelves and Bays
   - Racks
   - Rigid Containers
   - Tanks
   - Transfer Pipes and Ducts
3. **Hazardous Materials**
   - Flammable and Combustible Solids and Powders
   - Flammable and Combustible Liquids
   - Compressed Gas Cylinders
   - Chemicals

1. General Safety Tips for Material Storage

☑ KEEP all exits clear.

KEEP storage areas neat and organized to avoid accidents.

KEEP stored materials well clear of sprinkler heads, electrical panels and emergency equipment.

MARK storage areas with lines on the walls or shelf supports to indicate maximum height or load limits.

STORE the heaviest items nearest the floor.

OBTAIN information about safe use and safe handling of containers from the manufacturer.

☒ DO NOT pile materials in an unstable or cluttered manner.

DO NOT store hazardous materials with general storage.

DO NOT obstruct fire hoses and extinguishers, emergency showers and eyewashes, or spill clean-up equipment.

DO NOT exceed the load rating of floors, racks, or shelving units.

2. Storage Units

Bins, Silos and Hoppers

These are used to store fine or granular materials. They are usually fed by a conveyor system. Special precautions are required for storing materials which can undergo spontaneous combustion or create explosive dusts.

☑ FOLLOW confined space procedures and lock-out procedures (see p. 20-23) before entering a bin.

ENSURE guardrails and toe boards or gratings are present at all openings to prevent accidental falls into the bin.

ENSURE the slope of the bottom of the bin is adequate to allow free flow of material.

USE dust control when filling or emptying bins.

USE long rods or portable vibrators operated from the upper side to free jammed materials.

☒ DO NOT enter a bin from the lower end.

DO NOT enter a bin without a harness and lifeline.

Pallets and Skids

These flat platforms are used to move and store materials. They are generally constructed in standard sizes for use with standard pallet movers and forklifts. They may be constructed of wood, plastic or metal.

☑ INSPECT pallets for damage before using.

ENSURE the pallet is designed for the load.

CROSS-TIE, band or wrap loads before stacking.

☒ DO NOT stack pallet loads unless the pallets are double faced.

DO NOT stack pallets holding bulky or unstable materials.

DO NOT use inappropriate, faulty or broken pallets.

Shelves and Bays

Shelves are general purpose storage areas for loose items and small packages.

Bays are generally shelf units consisting of upright, cross bracing and horizontal supports. They are designed to hold specific sized pallets or rigid containers. High bay storage is becoming the preferred method of storage in large warehouses.

Forklifts are generally used to transfer materials to and from bays.

☑ ENSURE units are designed for the loads planned.

ENSURE units are properly anchored for stability.

PROVIDE lips on shelves where small items or hazardous materials are stored.

PLACE heavy materials on lower shelves where they can be easily reached.

DO NOT overload shelves.

DO NOT use shelves and the top of shelves as "catch-all" bays.

Racks

Racks are used to store long items or items which tend to roll.

A horizontal rack can be either single-sided along a wall, a double-sided "A" frame or "H" frame, or a heavy frame with rollers. The support arms on "A" frames and front loading racks should slope towards the back and have upturned ends to prevent materials from rolling off.

Vertical racks are used for shorter materials. The racks generally have dividers or pegs to prevent sideways motion and restraints (chains) to hold the material in place.

ENSURE the rack is designed for the planned loads.

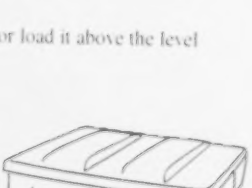
ENSURE the rack is firmly anchored to prevent movement and braced to prevent tipping.

INSPECT racks regularly for signs of damage or weakness. Weld joint checks should be done by a qualified person.

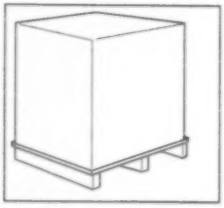
LOAD with even weight on both sides to maintain stability.

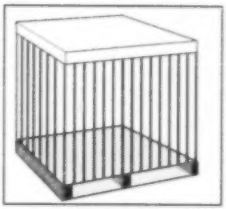
DO NOT overload a rack or load it above the level of the stops.

Rigid Containers



Containers specifically designed for bulk storage of materials may be in the form of containerized pallets or steel or plastic containers. They are usually designed for bay storage and usually interlock for increased stability during stacking.





☑ INSPECT containers before stacking.

FOLLOW manufacturer's recommendations on the safe height of stacking.

☒ DO NOT mix containers of different types or sizes.

DO NOT use damaged containers.

Tanks

Tanks are containers designed to store liquids, usually fed by transfer pipes. They can be almost any size.

☑ ENSURE all tanks are properly grounded. This is especially important if the tank contains flammable materials.

FOLLOW confined space and lockout procedures for entering a tank (see p. 20-23).

ENSURE tanks have a liquid proof pit or other spill containment device adequate to hold the contents in the event of leakage.

ENSURE all interior tanks have vents leading directly to the outside.

ENSURE all openings have lockable closures.

LABEL all pipes and other fittings feeding or controlling the system, indicating product name, potential hazards, and direction of flow.

☒ DO NOT enter a tank without a harness and lifeline.

Transfer Pipes and Ducts

Pipes and ducts are used to fill or empty storage containers. Static electricity can build up from the movement of their contents.

ENSURE all parts of the system are bonded and grounded.

USE confined space procedures (see p. 20-21) when servicing parts of the system that are below grade.

PROVIDE secondary containment for systems which carry corrosive, toxic or flammable materials.

USE only self-priming pump and feed systems.

ENSURE all lines have a slope to allow drainage and cleaning. This is very important where the same line and pumps feed multiple storage units with different materials.

CLEAN all tools used on pipelines to prevent transfer of chemicals, contamination and corrosion.

DO NOT perform maintenance work without following lockout procedures (p. 20-23).

3. Hazardous Materials

Warehouses need to establish policies and procedures for safe handling of hazardous materials. Such policies and procedures must include:

- product labels on all containers
- availability of material safety data sheets (MSDS)
- employee education in safe work practises

Flammable and Combustible Solids and Powders

Risks

- fire or explosion caused by dust build-up
- fire from a chemical that is reactive and wet

WARN workers and visitors about the hazards and the precautions to take.

ENSURE all recommended fire fighting equipment is available.

KEEP dust level below the lower explosive limits by using proper ventilation.

KEEP a scheduled cleaning program which includes structural cleaning and elimination of dust from areas where it can collect and later be circulated.

STORE materials in fire-resistant bins when practical.

SPACE stored materials to allow inspection, and to prevent heat buildup and spread of fire from smouldering materials. Some materials will burn without a visible flame and produce colourless, odourless gases.

USE spark-resistant tools.

ENSURE all conductive (metal) equipment is grounded and any plastics used do not create static electrical sparks. If flammable metals (Class D fire rating) are present, be sure proper Class D fire fighting materials are available and workers are trained in their use.

☒ DO NOT sweep with a standard broom. Use a wet mop instead.

DO NOT use standard vacuum cleaners. Use commercial cleaners with high efficiency air (HEPA) filter and sealed motors, or use a dust collection system.

DO NOT operate electrical or gas powered equipment. A spark may cause fire.

Flammable and Combustible Liquids

These liquids can burn and produce flame if the liquid temperature exceeds a certain limit called **flash point**.

> **Flash point** is the lowest temperature at which the liquid gives off enough vapour to form an ignitable mixture with air. In presence of an ignition source, the air-vapour mixture produces flame.
>
> National Fire Code (Canada) and CSA define flammable and combustible liquids as follows:
>
> **Flammable liquids** have a flash point *below* 37.8°C (100°F)
>
> **Combustible liquids** have flash point *at or above* 37.8°C (100°F) and below 93.3°C (200°F)

A similar definition is given by the US National Fire Protection Association.

Flammable and combustible liquids are generally shipped in bulk by tankers or in smaller amounts in drums, carboys or cases of smaller containers.

Flammable liquids should always be stored in isolated, explosion-resistant areas with blow-out walls.

For details, please consult fire prevention act and regulations applicable to your workplace.

☑ STORE prepackaged flammable and combustible liquids in their own designated storage areas.

WARN workers and visitors in the area about the hazards and the precautions to take.

ENSURE emergency response assistance and spill control supplies and equipment are available.

USE catch trays or spill sumps for containing the contents of the largest container in the event of a leak.

ENSURE all recommended fire fighting equipment is available.

USE spark-resistant tools.

ENSURE all conductive (metal) equipment is grounded and any plastics used do not create static electrical sparks.

KEEP drums and carboys out of direct sunlight.

☑ DO NOT reuse empty containers without ensuring they are completely clean and free of liquid and vapours.

Compressed Gas Cylinders

STORE different types of gases in separate areas.

STORE cylinders away from electrical sources.

STORE in well ventilated, cool, dry areas above ground.

STORE away from emergency exits.

Flammable Gas

STORE cylinders in a well ventilated area which is fire-resistant and explosion-resistant.

USE only spark-resistant hand tools and explosion-resistant power tools in the area.

Chemicals

A transport label (placard) on a carton helps determine the type of hazard. Containers should have labelling which conforms to Transportation of Dangerous Goods (TDG) WHMIS (see p. 125, 128-129). MSDSs should be available where hazardous materials are handled regularly.

In the event of a spill contact the manufacturer, or call for emergency spill reporting assistance (see p. 130-131).

KNOW your company's emergency plan and what to do if there's an accident.

OBTAIN TDG training.

WEAR required personal protection.

KNOW the location of the nearest emergency showers and eyewash stations where toxic materials are handled.

USE separate storage areas for corrosive and toxic materials. The areas should have impervious chemical-resistant walls and floors.

TAKE a shower and change clothes before leaving, to avoid carrying residues home.

DO NOT wear clothing on which static electricity can build up. In dry conditions, static electricity can spark and start fires.

DO NOT eat or drink in areas where chemicals are handled.

Pesticides

There are specific regulations governing the handling and storage of pesticides. Check specific regulations and guidelines in your jurisdiction.

Shipping Hazardous Materials

ATTACH appropriate TDG labels on the package for each hazardous material packed within.

ATTACH labels on two opposite sides for radioactive materials.

DISPLAY primary and secondary hazard labels next to each other.

Section X

The Work Environment

1. **Vibration**
2. **Noise**
3. **Dust**
4. **Lighting**
5. **Working in Hot Environments**
   - Health and Safety Legislation and ACGIH Guidelines
   - Humidex
   - Potential Health Problems
   - Preventing Heat Related Illness
6. **Working in Cold Environments**
   - Effect of Wind
   - Equipment Design
   - Exposure Control
   - Protective Clothing
7. **Ultraviolet (UV) Radiation**
   - UV Index

1. Vibration

Vibration exposure occurs in two ways:

- whole body vibration exposure from driving a vehicle over a bumpy terrain
- hand-arm vibration exposure from operating a vibrating hand-held tool such as a chain saw

Whole body vibration affects the entire body and may cause lower back pain and disorders of joints and muscles.

Hand-arm vibration exposure causes white finger disease or Raynaud's phenomenon which affects the fingers. Early symptoms of white finger are tingling and numbness of the fingers, especially when exposed to cold. Prolonged vibration exposure may result in blanching of the fingers, persistent numbness and loss of grip.

It is possible to prevent white finger disease by reducing exposure time and using:

- vibration-free equipment
- vibration-absorbing mounts or shock absorbers
- vibration-absorbing handles and vehicle seats
- vibration-absorbing gloves

2. Noise

Noise is too loud and potentially harmful for your hearing when:

- you have difficulty talking to someone;
- you feel ringing sound in your ears after prolonged exposure;
- your hearing is numbed at the end of the work shift and comes back the next morning.

Noise exposure for several years can cause permanent hearing loss which cannot be cured by medical treatment. Not everyone is equally affected. As the level of noise and exposure time increases, however, more and more people are affected.

The loudness of noise is expressed in dB(A), A-weighted decibel units. The dB(A) levels of some common sounds in a warehouse are given below:

Forklift Truck *(not sound-proofed)*	90 - 95
Tractor	85 - 90
Mobile Equipment	85 - 90
Manual Cart	70 - 75

Noise regulations set exposure limits at 85-90 dB(A) for an eight-hour exposure, five days a week. The purpose of these limits is to prevent or minimize chances of hearing loss.

The best method of protection against noise is to use quieter machines. As an interim measure, use hearing protection as required by your employer.

3. Dust

Risks

- dust inhalation
- fire
- explosion

The level of risk depends on what the dust particles are made of. If you work with materials that create dust in the workplace, check warning labels on containers and take the following precautions:

☑ WEAR dust mask or respirator appropriate for the dust type and its toxicity.

ENSURE no open sources of ignition are present.

SCHEDULE regular cleaning with high efficiency particulate air filtre (HEPA filtre) vacuum cleaners or wet mopping.

PROVIDE extra local exhaust ventilation at the source of dust generation, especially for toxic dusts.

ENSURE that the ventilation system does not re-circulate the dust to other parts of the building.

CHECK the container warnings before using mists, sprays or increased humidity to control or remove dust. Humidity may increase the risk of fire for some materials.

☒ DO NOT use compressed air to remove dust from the work area, equipment or your body.

4. Lighting

Poor lighting can cause eye strain, vision problems and accidents.

☑ USE indirect lighting to eliminate shadows.

CHECK fluorescent lights for flicker. Replace fluorescent tubes regularly and maintain fixtures properly.

ENSURE that storerooms, corridors and stairways are well lit.

Appropriate light levels depend on type of work. The following chart gives recommended lighting levels.

Location	Light Level (LUX)
Corridors	50-150
Stairs	100-200
Coat Rooms	100-200
Stock Rooms	200-400
Traditional Office Tasks	500-750
Conference Rooms	300-750
Drawing Offices	500-1000

Check with your jurisdiction for regulations regarding recommended light levels.

5. Working in Hot Environments

Working in hot environments can be uncomfortable and have adverse health effects. How hot we feel depends on temperature, humidity, wind speed (air movement) and type of work.

Health and Safety Legislation and ACGIH Guidelines

Some jurisdictions have health and safety regulations for working in hot environments while others do not. In absence of such regulations people generally use Threshold Limit Values (TLV) and guidelines recommended by the American Conference of Governmental Industrial Hygienists (ACGIH). The occupational exposure limits are given as WBGT (Wet Bulb Globe Temperatures) in °C or °F units. The WBGT index takes into account air temperature, humidity, presence of direct sunlight and hot objects in the vicinity.

Humidex

In the weather forecast, the degree of environmental heat is often given in terms of humidex which is determined by taking into account the temperature and humidity of the ambient air.

Humidex Range	Degree of Comfort
20-29	Comfortable
30-39	Varying degrees of discomfort
40-45	Uncomfortable
46 and over	Many types of labour must be restricted

Potential Health Problems

Heat Stroke

The most serious heat illness is heat stroke. Signs of heat stroke include dry, hot skin due to failure of sweating and complete or partial loss of consciousness. Heat stroke can be fatal and requires prompt first aid and medical attention.

Other Health Disorders

Less severe health problems include:

- Heat edema – swelling of the ankles.
- Heat rashes – tiny red spots on the skin that cause a prickling sensation during heat exposure.
- Heat cramps – sharp pains in muscles resulting from the failure to replace salt lost from sweat.
- Heat exhaustion – weakness, dizziness, visual disturbances, intense thirst, nausea, headache, vomiting, diarrhoea, muscle cramps, breathlessness, palpitations, and tingling and numbness of the hands and feet.
- Heat syncope (fainting) – caused by the loss of body fluids through sweating and by lowered blood pressure, due to pooling of blood in the legs while working in a standing position.

If you notice any of the above symptoms, go to a cool place, drink plenty of cool water, rest and consult your doctor.

Preventing Heat Related Illness

Acclimatization – People who work regularly in hot environments develop a certain degree of tolerance (acclimatization) for heat. Most of the acclimatization occurs in the first three or four days, and complete acclimatization may require seven to eleven days.

Clothing – Loose cotton clothing provides adequate protection in hot and humid conditions.

Work/Rest Schedule – American Conference of Governmental Industrial Hygienists (ACGIH) has recommended a schedule of work/rest periods for working in hot conditions. Ask your supervisor about your company's policy in this regard.

Drinking Water – Drink plenty of cool 10 -15° C (50 -60° F) water or fruit drink every 15 to 20 minutes even though you may not feel thirsty. Thirst is an inadequate indicator of the body's need for fluid.

6. Working in Cold Environments

Working in the cold can be dangerous to people who are unprepared or who don't have adequate protective clothing. Two common types of cold hazards are hypothermia and frostbite.

Hypothermia can be fatal. It results from the cooling of the deep inner body or core to a temperature below 34.5° C (94.1° F) due to prolonged exposure to cold. Persons exhausted during physical work are more prone to hypothermia. The victim can become listless, confused and make little or no effort to keep warm. The survival of hypothermia victims depends on the ability of others to recognize the symptoms and provide timely help.

The victim should be immediately wrapped in blankets, and moved to a warm room. Body heat (from cuddling) is the most effective way to warm a hypothermia victim. Immediate medical care is necessary.

Caution: Consumption of alcohol does not increase tolerance to cold. Instead, it increases the risk of hypothermia.

Frostbite is the freezing of body tissues as a result of extremely cold temperatures or contact with extremely cold metallic objects such as an automobile or a fence.

Effect of Wind

At any temperature, one feels colder when it is windy. The combined effect of cold and wind speed is expressed as equivalent chill temperature (ECT). Skin should not be exposed for long when ECT is 32° C (–25° F) or lower.

Equipment Design

For work below the freezing point, metal handles and bars should be covered by thermal insulating material. Workers should be able to operate machines without removing their mittens.

Exposure Control

USE recommendations in your health and safety legislation or ACGIH guidelines to control cold exposure and prevent hypothermia.

Protective Clothing

Multiple layers of lightweight loose fitting clothing provide better protection against the cold compared to a single thick layer of clothing. Eye protection must be separated from respiratory channels (nose and mouth) to prevent exhaled moisture from fogging and frosting eye shields. For work in wet conditions, the outer layer of clothing should be waterproof. Clothing should be kept clean. Dirt destroys its insulating ability. Clothing must also be dry.

Gloves should be used below 4° C for light work and below 8° C for moderate work. For work below 17° C, mittens should be used. Felt-lined, rubber-bottomed, leather-topped boots with removable felt insoles are best suited for heavy work in cold.

Almost 50 percent of body heat is lost through the head when the rest of the body is covered. A wool knit cap or a liner under a hard hat reduces excessive heat loss.

7. Ultraviolet (UV) Radiation

UV exposure may cause damage to the skin and eyes. UV rays are an invisible part of sunlight. UV exposure is of concern mainly in summer months, however in winter, harmful exposures may occur as a result of direct exposure to sunlight and reflections from snow, sand and concrete. Prolonged exposure increases the risk of skin cancer.

UV Index

The Environment Canada weather forecast service rates the UV intensity as UV index on a scale of 0 to 10. The implications of the UV index are summarized in the table on the following page.

The following practises are recommended to minimize UV exposure during outdoor work:

- Avoid midday sun (11 am–4 pm in summer months).
- Wear clothing that is tightly woven to block sunlight.
- Wear a broad-brimmed hat that will shade your face, neck and ears.
- Apply on exposed skin a waterproof sunscreen with a sun protection factor (SPF) of 15 or higher and which has both UVA and UVB protection.
- Wear UV filtering sunglasses. Plastic safety glasses and plastic sunglasses are good UV filters.
- Avoid unnecessary exposure. Seek shade when you don't have to be in the sun.

UV Index	Category	Time of Year over Southern Canada	Implications
9+	Extreme (rare in Canada)	May to mid August	Sunburns and skin damage can occur in less than 15 minutes. Minimize exposure. Take full precautions.
7 to 9	High	May to mid-August (midday)	Sunburns and skin damage can occur quickly. Minimize sun exposure if possible. Take full precautions.
4 to 7	Moderate	Spring and early Fall	Take precautions to limit exposure to the sun. Moderate periods in the sun may still cause burning.
<4	Low	Fall and Winter	Minimal precautions necessary for normal activity. Long periods in the sun may still cause skin damage.

Section XI

Occupational Health and Safety (OH&S) Legislation

1. **OH&S Legislation**
   - Government's Responsibilities
   - Worker's Rights and Responsibilities
   - Employer's Responsibilities
   - Health and Safety Committee
   - Role of Health and Safety Committee
   - Work Refusals
2. **Workplace Hazardous Materials Information System (WHMIS)**
   - WHMIS Symbols and Classes
3. **US Occupational Health and Safety Legislation**
4. **Fire Code**
5. **Building Code**
6. **Transportation of Dangerous Goods Act**
7. **Emergency Spill Reporting and Assistance**

The purpose of Occupational Health and Safety (OH&S) legislation is to protect you, the worker, against hazards on the job. It outlines the general rights and responsibilities of the employer, the supervisor and the worker.

The law makes both you and your employer jointly responsible for workplace health and safety.

1. OH&S Legislation

Each of the provinces and the federal government have their own OH&S legislation. The details of the OH&S legislation vary slightly from one jurisdiction to another but the basic elements are the same. These basic elements include the following:

Government's Responsibilities

i) to enforce occupational health and safety legislation
ii) to conduct workplace inspections
iii) to disseminate information
iv) to promote training, education and research

Worker's Rights

i) to refuse unsafe work
ii) to participate in the workplace health and safety activities through Joint Health and Safety Committee (JHSC) or worker health and safety representative
iii) to know actual and potential dangers in the workplace

Worker's Responsibilities

i) to work in compliance with OH&S act and regulations
ii) to use personal protective equipment and clothing as directed by the employer
iii) to report workplace hazards and dangers

Employer's Responsibilities

i) to establish and maintain a joint health and safety committee, or cause workers to select at least one health and safety representative

ii) to take every reasonable precaution to ensure workplace is safe

iii) to train employees about any potential hazards

iv) to supply personal protective equipment and ensure workers know how to use the equipment safely and properly

v) to immediately report all critical injuries to the government department responsible for OH&S.

vi) to train all employees on how to safely use, handle, store and dispose of hazardous substances and handle emergencies

Health and Safety Committee (HSC)

i) must be comprised of one half management and at least one half labour representatives

ii) must meet regularly as required by the OH&S legislation

iii) must be co-chaired by one management chairperson and one worker chairperson

iv) employee representatives are elected or selected by the workers or their union

v) in Ontario, Canada, there must be two certified (one worker and one manager) members on a JHSC.

Role of Health and Safety Committee

i) to act as an advisory body

ii) to identify hazards and obtain information

iii) to recommend corrective actions

iv) to assist in resolving work refusal cases

v) to participate in accident investigations and workplace inspections

Work Refusals

You can refuse work if you have reason to believe that the situation is unsafe to either yourself or your co-workers.

i) You must report to your supervisor that you are refusing to work and state why you believe the situation is unsafe.

ii) You, your supervisor, and a JHSC worker-member or worker representative will investigate.

iii) You return to work if the problem is resolved.

iv) If the problem is not resolved, a government health and safety inspector is called.

v) Your supervisor may assign you reasonable alternative work.

vi) Inspector investigates and gives decision.

2. Workplace Hazardous Materials Information System

WHMIS (Pronounced whimiss)

WHMIS applies to all Canadian workplaces. It requires that all workers who work with or near a hazardous substance (controlled product) be informed about its potential hazards and recommended safe work practises. WHMIS requires that information be provided in three ways:

1. All controlled products used in the workplace must have a WHMIS label on the container.
2. Material Safety Data Sheets (MSDS) and hazard information must be readily available in the workplace. An MSDS summarizes the health and safety information about the product.
3. Workers must receive training to be able to recognize and work safely with chemicals.

The HAZARD SYMBOL is an important part of the WHMIS label. It warns the user that a particular hazard exists. Actual hazards from toxic substances depend on the amount (level and duration) of exposure. A brief exposure at high levels may result in chemical poisoning within hours. Prolonged exposure at low levels may cause illness after several years.

WHMIS Symbols and Classes

	Class A Compressed Gas	Contents under high pressure. Cylinder may explode or burst when heated, dropped or damaged.
	Class B Flammable and Combustible Material	May catch fire when exposed to heat, spark or flame. May burst into flames.
	Class C Oxidizing Material	May cause fire or explosion when in contact with wood, fuels and other combustible material.
	Class D, Division 1 Poisonous and Infectious Material: immediate and serious toxic effects	Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.
	Class D, Division 2 Poisonous and Infectious Material: other toxic effects	Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects, or other permanent damage.
	Class D, Division 3 Poisonous and Infectious Material: biohazardous infectious material	May cause disease or serious illness. Drastic exposures may result in death.
	Class E Corrosive Material	Can cause burns to eyes, skin or respiratory system.
	Class F Dangerously Reactive Material	May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.

3. US Occupational Health and Safety Legislation

General Outline

In the United States of America (USA) the Occupational Safety and Health Act is popularly known as OSHAct. The Occupational Safety and Health Administration (OSHA) is responsible for administering the OSHAct.

The OSHAct does not cover the following four categories of people:

- self-employed persons;
- farms which employ only immediate family members of the farm employer;
- workers covered by other legislation; or
- state and local government employees.

Regulations dealing with OSHA are published in Title 29 of the Code of Federal Regulations as:

- 29 CFR Part 1910—Occupational Safety and Health Standards; and
- 29 CFR Part 1926—Construction Standards.

These standards define exposure limits, exposure monitoring methods, medical surveillance and protective measures.

Duties of Employers

The OSHAct sets out two main duties for employers:

- employers must provide a workplace which is free from hazards that are known to cause or likely to cause death or serious physical harm to employees; and
- employers must comply with occupational safety and health standards under the Act.

Duties of Employees

Employees must comply with occupational safety and health standards, rules, regulations and orders which are applicable to their own conduct and actions.

Key Provisions

Some of the key provisions of the OSHAct are to:

- assure, insofar as possible, that every employee has safe and healthy working conditions;
- require employers to maintain accurate records of exposures to potentially toxic materials or harmful physical agents and inform employees of the monitoring results;
- provide for employee walk-around or interview of employees during the inspection process; and
- provide procedures for investigating alleged violations, at the request of any employee or employee representatives, issuing citations and assessing monetary penalties against employers.

Hazard Communication

The intent of the OSHA Hazard Communication Standard is to provide employees with information and training about the potential health hazards from exposure to workplace chemicals. The Standard requires that employee training include:

- explanations of the requirements of the standard;
- identification of workplace operations where hazardous chemicals are present;
- knowledge of the methods and observations used to detect the presence of hazardous workplace chemicals;
- assessment of the physical and health hazards of those chemicals;
- warnings about hazards associated with chemicals in unlabelled pipes;

- descriptions of hazards associated with non-routine tasks;
- details about the measures employees can take to protect themselves against these hazards, including specific procedures;
- explanation of the labelling system;
- instructions on location and use of material safety data sheets (MSDSs); and
- details on the availability and location of the hazardous materials inventory, MSDSs, and other written hazard communication material.

Hazard Warning and Symbols

Chemicals produced in the USA come under OSHA Hazard Communication Standard. The label on the container must warn about potential hazards of the product. OSHA does not require hazard symbols on the label, however, the skull and crossbones symbol is acceptable on containers of highly toxic substances and the flame symbol is acceptable on containers of flammable substances.

4. Fire Code

The Fire Code sets the requirements for fire prevention and protection. These include requirements for:

i) building design complementing the building code

ii) fire protection and fire detection systems

iii) storage of specific materials

iv) fire inspections

Authority: The Fire Code is enforced by the local fire department in your city.

Information and Training: Contact your local fire department for additional information and employee education in fire safety procedures.

5. Building Code

The Building Code sets standards and guidelines for buildings, structures and systems. Heating, ventilation, storage, renovations, and maintenance requirements are part of the Building Code.

The objective of the Building Code is to make sure that:

i) buildings are structurally adequate for their intended use;

ii) structures and materials can withstand temperature extremes and ice and snow loads;

iii) building design meets fire safety code, electrical safety code and other regulatory requirements;

iv) building is suitable for the planned occupancy.

Information: Contact your employer or the city for information regarding the building code applicable to your workplace.

6. Transportation of Dangerous Goods Act

The Act requires that individuals handling, shipping or transporting dangerous goods receive training or operate under the direct supervision of a trained person. The training must be specifically for the dangerous materials the worker is to work with.

Certificates are issued on completion of the training and are valid for 3 years (1 year for air freight handling).

The training includes:

i) characteristics and classification of dangerous goods

ii) packaging required

iii) labelling – package markings required

iv) documentation – waybills or manifests

v) any special precautions

vi) reporting procedures and requirements

vii) emergency procedures

viii) special equipment required for handling dangerous goods

viii) safety equipment which should be used and the proper manner of using it

Transport Hazard Symbols and Identification Numbers

Transport Hazard Symbols and Identification Numbers are used to warn workers, emergency response crews and the public of the nature of dangerous goods in shipments.

Dangerous Goods are divided into Classes, Divisions and Packing Groups.

The Packing Groups

Packing Group I – **very dangerous**

Packing Group II – **dangerous**

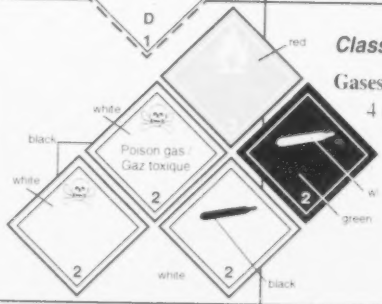
Packing Group III– **moderately dangerous**

The Nine Classes of Dangerous Goods

Class 1

Explosives

5 divisions



Class 2

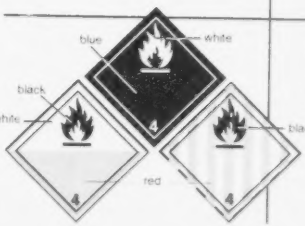
Gases

4 divisions

Class 3

Flammable Liquids

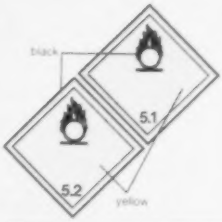
3 divisions



Class 4

Flammable Solids

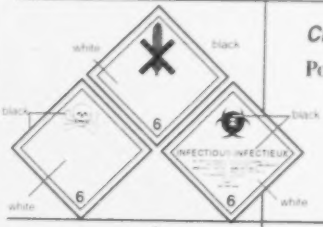
3 divisions



Class 5

Oxidizing Substances

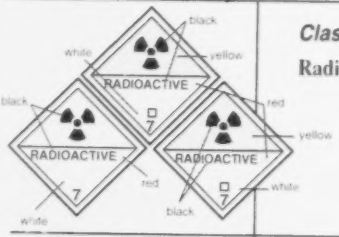
2 divisions



Class 6

Poisonous Substances

2 divisions



Class 7

Radioactive Materials

Class 8

Corrosive Substances

Class 9

Miscellaneous Products

3 divisions

7. Emergency Spill Reporting and Assistance

These services are intended to assist in the event of a spill during transport of hazardous materials. They provide information, assist with the appropriate reporting, and activate emergency response teams for spill control and clean-up.

CANADA

Transport Canada Information and Emergency Centre (CANUTEC)

CANUTEC is responsible for any spill involving railways or radioactive materials as well as general spill assistance.

Contact number for information (613) 992-4624

24 hour Emergency Response number (613) 996-6666

Transport Emergency Assistance Plan (TEAP)

TEAP is established by the Canadian Chemical Producers' Association (CCPA). It provides expert advice and has teams available to provide assistance in cases of accidents involving chemicals belonging to CCPA members.

Contact the Canadian Chemical Producers Association:(613)237-6215

UNITED STATES

CHEMTREC, a service of the Chemical Manufacturers Association, provides emergency assistance information to all callers. Call toll free in the US and Canada 1-800-424-9300.

CHEM-TEL, INC., an emergency response communication service, can be reached 24 hours in the US and Canada by calling toll free 1-800-255-3924.

US Environmental Protection Agency (EPA)

EPA is responsible for chemical spills that pose danger to the environment. Contact the nearest EPA office for information (see p.136).

US Occupational Safety and Health Administration (OSHA)

For toxic spills in the workplace consult OSHA guidelines. Contact addresses and telephone numbers are listed in the last section of this Guide (see p. 137).

Section XII

Information Sources

1. Canadian Government Departments with Responsibility for Occupational Health and Safety
2. US Federal Safety and Health Agencies
3. State Occupational Safety and Health Plans

1. Canadian Government Departments Responsible for Occupational Health and Safety

Canadian Centre for Occupational Health and Safety (CCOHS)

Client Services
Phone: 905-570-8094
Toll-free: 1-800-668-4284 (Canada and US only)
Fax: 905-572-2206
E-mail: clientservices@ccohs.ca
Web Site: www.ccohs.ca

Inquiries Service
(FREE answers to your OH&S questions)
Phone: 905-572-4400
Toll-free: 1-800-263-8466 (Canada only)
Fax: 905-572-4500
E-mail: inquiries@ccohs.ca
OSH Answers Web Site: www.ccohs.ca/oshanswers

Federal Jurisdiction

Labour Program
Human Resources Development Canada
Ottawa ON K1A 0J2
General information on federal programs, services and initiatives:
Toll-free: 1-800-O-Canada (1-800-622-6232)

Regional and District Offices
www.hrdc-drhc.gc.ca/menu/profile-search-e.html
Web Site: www.hrdc-drhc.gc.ca/common/workplaces.html

Provincial Jurisdictions

Alberta

Workplace Health and Safety
Alberta Human Resources and Employment
9940-106 Street
Edmonton, AB T5K 2N2
General Inquiries: (780) 415-8690
Toll-free: 1-866-415-8690
Fax: (780) 422-3730
E-mail: whs@gov.ab.ca
Web Site: www.gov.ab.ca/hre/whs/

British Columbia

Workers' Compensation Board of British Columbia
6951 Westminster Highway (Richmond, BC)
PO Box 5350 Stn Terminal
Vancouver, BC V6B 5L5

Workplace Safety and Health Inquiries
Phone: (604) 276-3100
Toll-free in B.C.: 1-888-621-7233 (SAFE)

Health and Safety Emergency Accident Reporting
Toll-free in B.C.: 1-888-621-7233 (SAFE)
After hours: 1-866-922-4357
Web Site: www.worksafebc.com

Manitoba

Workplace Safety and Health Division
Manitoba Labour and Immigration
200-401 York Avenue
Winnipeg, MB R3C 0P8
General Inquiries: (204) 945-3446
Toll free in Manitoba: 1-800-282-8069
After hours: (204) 945-0581
Fax: (204) 945-4556
Web Site: www.gov.mb.ca/labour/safety/

New Brunswick

Workplace Health, Safety and Compensation Commission of New Brunswick

500 Beaverbrook Court
Fredericton, NB E3B 5X4
General Inquiries: (506) 453-2467
Toll-free in NB: 1-800-442-9776
E-mail: prevention@whsccnb.ca
Fax: (506) 453-7982
Web Site: www.whscc.nb.ca/

Newfoundland and Labrador

Department of Labour

Confederation Building, 4th Floor, West Block
PO Box 8700
St. John's, NL A1B 4J6
General Inquiries: (709) 729-7420
Toll-free in NL: 1-800-563-5471
Fax: (709) 729-3445
Web Site: www.gov.nf.ca/labour/

Northwest Territories and Nunavut

Workers' Compensation Board of Northwest Territories and Nunavut

PO Box 8888
Yellowknife, NT X1A 2R3
General Inquiries: (867) 920-3888
Toll free: 1-800-661-0792
Fax: (867) 873-4596
E-mail: yellowknife@wcb.nt.ca
Web Site: www.wcb.nt.ca/home.htm

Iqaluit

PO Box 669
Iqaluit, NU X0A 0H0
Phone: (867) 979-8500
Fax: 1-800-877-404-4407
E-mail: iqaluit@wcb.nt.ca
Web Site: www.wcb.nt.ca/home.html

Nova Scotia

Nova Scotia Department of Environment and Labour
Occupational Health and Safety Division
5151 Terminal Rd., 6th Floor
PO Box 697
Halifax, NS B3J 2T8
General Inquiries: (902) 424-5400
Toll free in NS: 1-800-952-2687
Fax: (902) 424-5640
E-mail: labrohs@gov.ns.ca
Web Site: http://www.gov.ns.ca/enla/ohs/

Ontario

Ministry of Labour
Occupational Health and Safety Branch
655 Bay Street, 14th Floor
Toronto, ON M7A 1T7
General Inquiries: (416) 326-7770
Toll free in Ontario: 1-800-268-8013
Fax: 416-326-7761
E-mail: webohs@mol.gov.on.ca
Web Site: www.gov.on.ca/lab/ohs

Prince Edward Island

Workers' Compensation Board of PEI
Occupational Health and Safety Division
PO Box 757, 14 Weymouth Street
Charlottetown, PE C1A 7L7
General Inquiries: (902) 368-5680
Toll-free in PEI: 1-800-237-5049
Fax: (902) 368-5696
Web Site: www.wcb.pe.ca

Québec

Commission de la santé et de la sécurité du travail du Québec (CSST) (Occupational Health & Safety Commission)
CP 6056, Succursale Centre-ville
Montréal, PQ H3C 4E1
Phone: (514) 906-3060
Toll-free in PQ: 1-800-667-7585
Fax: (514) 906-3062
Web Site: www.csst.qc.ca

Saskatchewan

Saskatchewan Labour
Occupational Health and Safety Division
1870 Albert Street
Regina, SK S4P 3V7
Toll-free in SK: 1-800-567-7233
Fax: (306) 787-2208
E-mail: webmaster@lab.gov.sk.ca
Web Site: www.labour.gov.sk.ca/

Saskatoon Office:
Phone: (306) 933-5042
Toll-free: 1-800-667-5023
Fax: (306) 933-7339

Yukon Territory

Yukon Workers' Compensation Health and Safety Board
401 Strickland Street
Whitehorse, YT Y1A 5N8
General Inquiries: (867) 667-5645
Toll free in the Yukon: 1-800-661-0443
Fax: (867) 393-6279
E-mail: worksafe@gov.yk.ca
24-hour Emergency Line for Reporting Serious Workplace Accidents and Injuries: (867) 667-5450
Web Site: www.wcb.yk.ca

For an up-to-date listing of information sources visit *http://www.ccohs.ca/oshanswers/information/govt.html*

2. US Federal Safety and Health Agencies

US Environmental Protection Agency (EPA)

Ariel Rios Building
1200 Pennsylvania Avenue NW,
Mail Code 3213A
Washington, DC 20460
Phone: (202) 272-0167
Web Site: www.epa.gov

National Institute for Occupational Safety and Health (NIOSH)

4676 Columbia Parkway, Mail Stop C-13
Cincinnati, OH 45226-1998
Toll-free in the US: 1-800-35-NIOSH
(1-800-356-4674)
Outside the US: (513) 533-8328
E-mail: eidtechinfo@cdc.gov
Web Site: www.cdc.gov/NIOSH/homepage.html

Occupational Safety & Health Administration (OSHA)

200 Constitution Ave., NW
Washington, DC 20210
Phone: (202) 693-2000
Toll free Emergency Reporting: 1-800-321-OSHA (6742)
Web Site: www.osha.gov

A listing of the Regional Offices follows:

OSHA Regional Offices

Region 1: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, US Dept. of Labor – OSHA

JFK Federal Building, Room E340
Boston, MA 02203
Phone: (617) 565-9860
Fax: (617) 565-9827
Web Site: www.osha.gov/oshdir/r01.html

Region 2: New Jersey, New York, and Puerto Rico, Virgin Islands, USA Dept. of Labor – OSHA

201 Varick St., Rm. 670
New York, NY 10014
Phone: (212) 337-2378
Fax: (212) 337-2371
Web Site: www.osha.gov/oshdir/r02.html

Region 3: District of Columbia, Delaware, Maryland, Pennsylvania, Virginia and West Virginia, USA Dept. of Labor – OSHA

The Curtis Center, Suite 740 West
170 S. Independence Mall West
Philadelphia, PA 19106-3309
Phone: (215) 861-4900
Fax: (215) 861-4904
Web Site: www.osha.gov/oshdir/r03.html

Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee, USA Dept. of Labor – OSHA

61 Forsyth St. SW
Atlanta, Georgia 30303
Phone: (404) 562-2300
Fax: (404) 562-2295
Web Site: www.osha.vog/oshdir/r04.html

Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, USA Dept. of Labor – OSHA

230 South Dearborn St., Rm. 3244
Chicago, IL 60604
Phone: (312) 353-2220
Fax: (312) 353-7774
Web Site: www.osha.gov/oshdir/r05.html

Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, USA Dept. of Labor – OSHA

525 Griffin St., Rm. 602
Dallas, TX 75202
Phone: (214) 767-4731
Fax: (214) 767-4693
Web Site: www.osha.gov/oshdir/r06.html

Region 7: Iowa, Kansas, Missouri, and Nebraska, USA Dept. of Labor – OSHA

City Center Square
1100 Main St., Suite 800
Kansas City, MO 64105
Phone: (816) 426-5861
Fax: (816) 426-2750
Web Site: www.osha.gov/oshdir/r07.html

Region 8: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, USA Dept. of Labor – OSHA

1999 Broadway, Suite 1690
PO Box 46550
Denver, CO 80202-6550
Phone: (303) 844-1600
Fax: (303) 844-1616
Web Site: www.osha.gov/oshdir/r08.html

Region 9: Samoa, Arizona, California, Guam, Hawaii, Nevada, and Trust Territory of the Pacific Islands, USA Dept. of Labor – OSHA

71 Stevenson Street St.
4th Floor, Suite 420
San Francisco, CA 94105
Phone: (415) 975-4310
Fax: (415) 975-4319
Web Site: www.osha.gov/oshdir/r09.html

Region 10: Alaska, Idaho, Oregon, Washington, USA Dept. of Labor – OSHA

1111 Third Avenue, Suite 715
Seattle, Washington 98101-3212
Phone: (206) 553-5930
Fax: (206) 553-6499
Web Site: www.osha.gov/oshdir/r10.html

3. State Occupational Safety and Health Plans

Alaska

Alaska Department of Labor and Workforce Development
P.O. Box 21149
Juneau, Alaska 99801-1149
Physical location:
1111 W. 8th Street, Room 304
Juneau, Alaska 99801-1149
Phone: (907) 269-4955
Toll-free: 1-800-770-4940
Fax: (907) 269-4950
Web Site: www.labor.state.ak.us/lss/home.htm

Arizona

Industrial Commission of Arizona
800 W. Washington
Phoenix, Arizona 85007-2922
Phone: (602) 542-5795
Fax: (602) 542-1614
Web Site: www.ica.state.az.us/ADOSH/oshatop.htm

California

California Department of Industrial Relations
455 Golden Gate Avenue - 10th Floor
San Francisco, California 94102
Phone: (415) 703-5050
toll-free: 1-800-963-9424
Fax: (415) 703-5114
Web Site: www.dir.ca.gov/occupational_safety.html

Connecticut

Connecticut Department of Labor
Consultation Services
Division of Occupational Safety and Health
38 Wolcott Hill Road
Wethersfield, Connecticut 06109
Phone: (860) 566-4550
Fax: (860) 566-6916
Web Site: www.ctdol.state.ct.us/osha/osha.htm

Hawaii

Hawaii Department of Labor and Industrial Relations
Consultation and Training Branch
830 Punchbowl Street, Room 423
Honolulu, Hawaii 96813
Phone: (808) 586-9100
Fax: (808) 586-9104
Web Site: www.hiosh.hawaii.gov

Indiana

Indiana Department of Labor
Indiana Government Center – South
402 W. Washington Sreet, Room W195
Indianapolis, Indiana 46204
Phone: (317) 232-2655
Fax: (317) 232-3790
Web Site: http://www.state.in.gov/labor

Iowa

Iowa Division of Labor Services
Occupational Safety and Health
1000 E. Grand Avenue
Des Moines, Iowa 50319-0209
Phone:(515) 281-7629 Consultation
Phone:(515) 281-0202 Education
Fax: (515) 281-5522
Web Site: www.state.ia.us/iwd/labor/index.html

Kentucky

Kentucky Labor Cabinet
1047 U.S. Highway 127 South, Suite 4
Frankfort, Kentucky 40601

OSH Division of Compliance
Phone: (502) 564-3070 ext. 266
Fax: (502) 564-4769

OSH Division of Education and Training
Phone: (502) 564-3070
Fax: (502) 564-4769
Web Site: www.labor.ky.gov/osh/index.htm

Maryland

Maryland Department of Labor, Licensing and Regulation

1100 North Eutaw Street, Room 613
Baltimore, Maryland 21201-2206
Maryland Occupational Safety & Health (MOSH)
Phone: (410) 767-2215
Fax: (410) 333-7747
Web Site: http://www.dllr.state.md.us/labor/mosh.html

Michigan

Michigan Department of Consumer and Industry Services, Bureau of Safety and Regulation

7150 Harris Drive
P.O. Box 30643
Lansing, Michigan 48909-8143
Phone: (517) 322-1814
Fax: (517) 322-1775
Web Site: www.michigan.gov/

Minnesota

Minnesota Department of Labor and Industry

443 Lafayette Road North
St. Paul, Minnesota 55155-4311
Phone: (651) 284-5060
Fax: (651) 284-5781
Web Site: www.doli.state.mn.us/wsc.html

Nevada

Nevada Division of Industrial Relations Occupational Safety and Health Enforcement

1301 N. Green Valley Parkway – Suite 200
Henderson, Nevada 89014
Phone: (702) 486-9020
Fax: (702) 990-0360
Web Site: dirweb.state.nv.us

New Jersey

New Jersey Department of Labor
Labor Standards and Safety Enforcement
Safety and Health
225 E. State Street
8th Floor West
P.O. Box 953
Trenton, New Jersey 08625-0953
Phone: (609) 292-3923
Fax: (609) 292-4409
Web Site: www.state.nj.us/labor/lsse/lspeosh.html

New Mexico

New Mexico Environment Department
Occupational Health and Safety Bureau
525 Camino de Los Marquez, Suite 3
PO Box 26110
Santa Fe, New Mexico 87502
Phone: (505) 827-4230
Fax: (505) 827-4422
Web Site: www.nmenv.state.nm.us/OHSB_website/ohsb_home.htm

New York

New York Department of Labor
Workplace Safety & Loss Prevention Program
Room 167 Bldg. 12 State Campus
Albany, New York 12240W
Phone: (518) 457-1125
Fax: (518) 485-1167
Web Site: www.labor.state.ny.us/business_ny/employer_responsibilities/safety/shdists.htm

North Carolina

North Carolina Department of Labor
4 West Edenton Street
Raleigh, North Carolina 27601
Bureau of Consultative Services
Phone: (919) 807-2796
Fax: (919) 807-2902
Web Site: www.nclabor.com/osha/osh.html

Oregon

Oregon Occupational Safety and Health Division
Department of Consumer & Business Services
350 Winter Street, NE, Room 430
Salem, Oregon 97310-3882
Phone: (503) 378-3272
Toll-free in Oregon: (800) 922-2689
Web Site: www.orosha.org/

Puerto Rico

Puerto Rico Department of Labor and Human Resources

Occupational Safety and Health Office
Department of Labor and Human Resources
505 Muñoz Rivera Avenue 20th Floor
Hato Rey, Puerto Rico 00918
Phone: (787) 756-1100, 1106
Fax: (787) 767-6051
Web Site: www.osha.gov.fso/osp/PRstandards.html

South Carolina

South Carolina Department of Labor, Licensing and Regulation
Office of OSHA Compliance
3600 Forest Drive
PO Box 11329
Columbia, South Carolina 29211-1329
Phone: (803) 734-9595
Fax: (803) 734-9772
Web Site: www.llr.state.sc.us/osha.asp

Tennesse

Tennessee Department of Labor and Workforce Development
710 James Robertson Parkway, 3rd Floor
Nashville, Tennessee 37243-0659
Phone: (615) 741-2793
Toll-free: 1-800-249-8510
Fax: (615) 253-1623
Web Site: www.state.tn.us/labor-wfd/tosha.html

Utah

Labor Commission of Utah
160 East 300 South, PO Box 146650
Salt Lake City, Utah 84114
Phone: (801) 530-6901
Fax: (801) 530-6992
Web Site: www.uosh.utah.gov/

Vermont

Vermont Department of Labor and Industry
Occupational Safety & Health Administration
National Life Building, Drawer 20
National Life Drive
Montpelier, Vermont 05602-3401
Phone: (802) 828-2765
Fax: (802) 828-2195
Web Site: www.state.vt.us/labind/vosha.htm

Virginia

Virginia Department of Labor and Industry (VOSH)
Powers-Taylor Building
13 South 13th Street
Richmond, Virginia 23219
Phone: (804) 786-8707
Fax: (804) 371-6524
Web Site: doli.state.va.us/whatwedo/coop_prog/consultation.html

Virgin Islands

Virgin Islands Department of Labor
Division of Occupational Safety and Health
3021 Golden Rock
Christiansted, St. Croix, Virgin Island 00840
Phone: (340) 772-1315
Fax: (340) 772-4323

Washington

Washington Department of Labor and Industries
PO Box 44850
Olympia, Washington 98504-4850
Phone : (360) 902-5799
Fax: (360) 902-5792
Toll-free: 1-800-423-7233
Web Site: www.lni.wa.gov/wisha/

Wyoming

Wyoming Department of Employment
Occupational Health and Safety
1510 East Pershing Blvd., West Wing
Cheyenne, Wyoming 82002
Phone: (307) 777-7786
Fax: (307) 777-3646
Web Site: wydoe.state.wy.us/doe.asp?ID=7

Publications in this series

Groundskeepers Safety Guide for groundskeepers, landscape contractors and nursery workers

Cold Weather Workers Safety Guide addresses the health and safety information needs of the outdoor worker

School Workers Health and Safety Guide for teachers, custodians, school administrators and school board officials

Office Ergonomics Safety Guide helps office workers to recognize ergonomic hazards and take remedial action

Food Service Workers Safety Guide covering all safety aspects of the food preparation and service industries

Warehouse Workers Safety Guide for workers in warehouses, storage facilities, bulk stores and the transport industry

Indoor Air Quality Health and Safety Guide addresses concerns about indoor air quality, and explains everything building occupants need to know about ensuring their health and comfort

Violence in the Workplace Prevention Guide an essential resource for anyone who wants to learn about workplace violence and its prevention

Welders Health and Safety Guide helps workers recognize hazards associated with welding work and to prevent injury and illness

Health and Safety Committees Reference Guide provides practical guidance for the formation and effective functioning of health and safety committees

Noise Control in Industry: A Basic Guide helps workers and employers recognize noise problems, take steps to control occupational noise exposure and develop a hearing conservation program.

Wellness in the Workplace provides practical steps and program suggestions for workplace health and wellness programs. Create a wellness program or integrate one or more initiatives into your existing framework.

Health and Safety Guide for Libraries will help you recognize, evaluate and control workplace hazards in libraries and other information centres.

Emergency Response Planning Guide will assist in developing a comprehensive emergency response plan for any size of business.

Mould in the Workplace – A Basic Guide includes information about moulds that workers may encounter in the workplace and tips for preventing health problems associated with exposure to mould.

For more information about these titles

905-570-8094 or **1-800-668-4284**

Fax: 905-572-2206 E-mail: clientservices@ccohs.ca

Web Site: www.ccohs.ca

CCOHS...

Canada's national centre for occupational health and safety. We provide unbiased information, advice and training on how to prevent illness and injury in the workplace.

When you have a question about health or safety, remember to use these FREE services:

Confidential Inquiries Service

1-800-263-8466
905-572-4400
inquiries@ccohs.ca

OSH Answers Web Service

www.ccohs.ca/oshanswers

For more information about CCOHS products and services:

905-570-8094 or 1-800-668-4284
Fax: 905-572-2206 E-mail: clientservices@ccohs.ca
Web Site: www.ccohs.ca

Canadian Centre for Occupational Health and Safety
135 Hunter Street East, Hamilton Ontario Canada L8N 1M5